

**Good Reading about Automobiles, Motors and
Cycles, and the People who Make and Use Them**

VOL. I

NEW SERIES

No. 2

MOTOR AGE

Subscriptions
Domestic, \$2.00
Foreign, \$4.00
Single Copies,
Five Cents

**With Which is Incorporated
THE CYCLE AGE**

The number of copies of this paper printed last week was 5150. The number of copies mailed, as shown by the Post Office receipt, published on page 1 was 4290. # The remainder were distributed by the Western News Co. and through the office of the paper. #

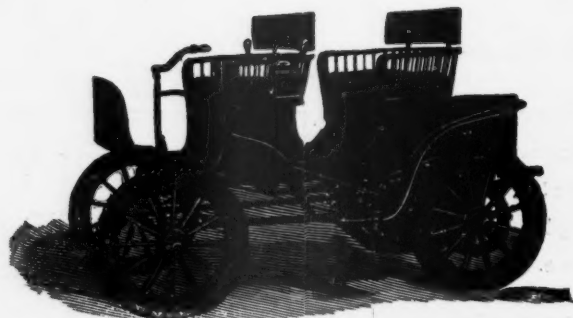
CHICAGO, JANUARY 9, 1902

Columbia and *Riker*

Automobiles

Electric—
Gasoline

In Sixth Year of Successful Service



Mark XIX, Columbia Surrey.

forty Miles on Each Battery Charge

Equipped with Exide batteries, Columbia and Riker electric vehicles excel all others in radius of reliable action. Every type of vehicle for every pleasure and business requirement. :: :: :: ::
Gasoline Carriages for long distance touring. Eight and Sixteen horsepower machines with running capacity of 150 miles and speeds from twenty to forty miles per hour. :: :: :: :: ::

1901 Illustrated Catalog and Price List on Request

Electric Vehicle Co., Hartford, Conn.

Western Agency and Show Rooms, 267 Wabash Ave., Chicago

The Motor Age

A budget of good reading about Automobiles,
Motors and Bicycles, and the people who make
and use them.

Motor Age and Cycle Age

MOTOR AGE, with which is incorporated CYCLE AGE, is published every Thursday at rooms 400-409 Monon building, 324 Dearborn street, Chicago, by Samuel A. Miles. It is entered at the Chicago postoffice as second-class matter.

The domestic subscription price is \$2 a year; foreign subscriptions, \$4 a year; single copy, 5 cents. Its advertising rates are as follows:

SPACE	One insertion	Discounts	7 issues	13 issues	26 issues	52 issues
One Page.....	\$30.00	7 issues 10% 13 " 15% 26 " 25% 52 " 33 1/3%	\$27.00	\$25.50	\$22.50	\$20.00
One-half Page.....	18.00		16.20	15.30	13.50	12.00
One-quarter Page.....	12.00		10.80	10.20	9.00	8.00
One-eighth Page.....	7.50		6.75	6.40	5.65	5.00
One Inch.....	4.00		3.60	3.40	3.00	2.65
		Net rates in following cols				

The circulation of this paper regularly exceeds 5,000 copies. The publisher holds himself ready to prove this statement whenever called upon by an advertiser.

The circulation of last week's issue was 5,150 copies. Of these 4,290, weighing 873 pounds, were mailed, as shown by the postoffice receipt. The remainder were distributed by the Western News Co. and the employees of the paper.

The postoffice receipt for the week, which will enable any one to check the circulation, is as follows:

No. 169 A. POSTOFFICE AT CHICAGO, STATE ILL.
Date Jan. 8, 1902.
Name of publication, MOTOR AGE.
Copies sent to subscribers, etc.....873 pounds
Total subject to postage at one cent per pound.....\$8.73
Received full prepayment of postage.
(Signed) F. E. COYNE, P. M.
By Mills.

No other paper furnishes as satisfactory proof of circulation or offers as low an advertising scale.

The editor will be glad to receive communications for publication. They must be accompanied by the names and addresses of senders, which will not be used if request be made to that effect. Contributions will not be paid for unless accompanied by notice that payment is expected.

The Chicago Club's Attitude

The attitude of the Chicago Automobile Club, in the matter of the proposed affiliation of clubs is clearly indicated in a letter to the president of the Automobile Club of America, set forth below. The members considered the proposal at their December meeting and decided on the plan outlined. No reply having been received, President Donald sees no impropriety in treating the communication as an open letter:

"As indicating the sense of the Chicago club, touching the proposals advanced by the Automobile Club of America," he says, "I beg to hand you a copy of our letter of the 17th ult. to President Shattuck, acknowledgment of which has not been made at this writing. As Chicago club finds no reason to recede from the position modestly advanced by the communication referred to, and inasmuch as you and others concerned in the question of the institution of a national federation of automobile interests, have expressed the desire to know the attitude of Chicago club, there is seemingly nothing improper in now regarding our response to President Shattuck as an open letter. Whether or not our club may conclude to invite other clubs and individuals sharing our opinions to join in a call for a convention at Chicago in March next, as suggested to the Automobile Club of America, will likely be determined by its annual meeting appointed for the 9th inst."

The letter to the president of the New York club follows:

Chicago, Dec. 17.—Mr. A. R. Shattuck, President Automobile Club of America, 753 Fifth Avenue, New York, N. Y.—Dear Sir: Chicago Automobile Club has, with much interest and in a spirit befitting the import of your proposal, given careful consideration to your esteemed favor, inviting affiliation with the Automobile Club of America. Chicago club is heartily in accord with the project of forming a governing body to promote the objects you have in contemplation. We beg to lay before you, however, modifications suggested by our membership, and indulge the hope of having your consideration to the end that your efforts may lead to the organization of a representative governing body of national scope.

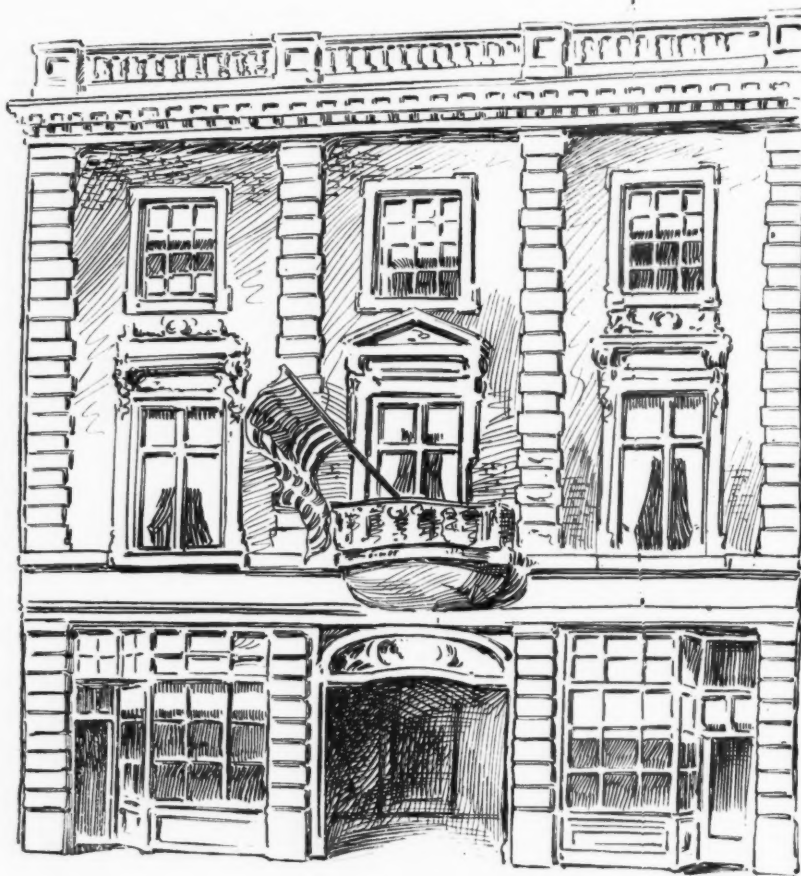
We feel that the Automobile Club of America is entitled to the recognition of the fraternity for its suc-

cessful work, intelligently and unselfishly performed in advancement of the sport and club interests, and, with full cognizance of the position your club now occupies as the leading organization of its character, we desire to subscribe to and support its projects as fully as may be possible.

Chicago club, and, we may add, western clubs generally, while heretofore less active than yours, are none the less destined to become important factors in the development of the automobile, the sport, the trade, improvement of our highways and proper conservation of legislative action. In Ohio there are a number of clubs

have not been successful. This is not due to discrimination on the part of eastern men against their fellows in the west, but to lack of appreciation of widely varying local conditions. We call your attention to these facts that you may appreciate our position and understand that the one object for which we contend is the institution of a representative governing body.

Having then given careful thought to the procedure proposed by your club, to the growing influence of the eastern clubs and to the conditions existing in the west, we are disposed to regard with favor the formation of a national association or interdependent lines, wherein



THE NEW HOME OF THE BOSTON CLUB.

of such prominence and activity that they have organized a state federation whose work is directly in line with that proposed by your plan of affiliation. There are many clubs round about us, so that, considering the youth of the art, the west has made substantial progress and bids fair to become as important in all that appertains to motor vehicles as it has had the good fortune to attain in many other industries and sports.

It has been the observation of members of Chicago club in touch with amateur sports that attempts to govern the entire country by a single eastern organization

all clubs may have such representation as may be warranted by their standing and in which all owners of automobiles, of acceptable repute, may become members at a nominal expense. The purposes of such organization would, naturally, be those contemplated by your plan of affiliation. The association should elect officers at an annual meeting and there should be committees to take charge of the various branches of the work. These bodies should, in our judgment, be national in scope and representative of all sections of the country.

The racing rules of the A. C. A., while doubtless as

full and as comprehensive as was possible at the time of their adoption, are not, in our respectful judgment, all that may be desired. We find on careful analysis that they are not in harmony, in some respects. We believe that the regulations you propose should be tentative and subject to emendation by an organization such as we suggest.

We are, as you probably know, promoting an exhibition to be held at the Coliseum building in this city, during the first week in March. We suggest that a meeting be appointed for that time by the A. C. A. in which representation from all the clubs of the United States and unattached owners be invited. It would be practicable, seemingly, by a conference between representatives of our respective clubs with such others as will lend co-operation to arrange for a convention of this character.

Should you favorably consider this recommendation Chicago club will appreciate and avail of the opportunity to extend its best hospitality to attending delegates. Yours most respectfully,

(Signed)

F. C. DONALD,
President Chicago Automobile Club.

Successful Opening of Boston Club

Boston, Mass., Jan. 2.—The splendid club house of the Massachusetts Automobile Club was completed on time and was dedicated last night. It is believed to be the first club house erected by an automobile club in the world and sets a pace which it will be hard for even the most prosperous clubs to follow. It is a veritable palace of comfort. There were about 300 persons present. The headquarters are at 751 Boylston street, between Exeter and Fairfield streets, and are central and easy of access. The appointments throughout are excellent and such as to win the approval of the most exacting.

Last night good cheer was dispensed. Music made the hours merry, and refreshments were served. The enthusiastic members gathered in its spacious parlors or around its roaring fireplace, and, forgetting the bitter cold outside, laughed and prophesied to each other how they would make the dust fly next summer. Warm words of congratulation were heard on every side, and "success" was the toast of the evening.

The headquarters in the heart of the city is, however, only a part of the scheme, for it is planned to have a country house about 20 miles outside of Boston where rest and refreshment can be obtained.

The members of the new organization number about 150. The club already has more applications than it can conveniently give favorable consideration. The organization is a consolidation of the influential Massachusetts Automobile Club and the Automobile Club of New England. It is composed of social leaders and solid, substantial business men. Its officers are as follows: Col. James T. Soutter, president; Eliot C. Lee, Dr. Joseph C. Stedman, vice presidents; Dr. F. L. D. Rust, secretary; Royal R. Sheldon, treasurer; A. W. Stedman, Charles J. Glidden, George E. McQuesten,

Henry Howard, J. Ransom Bridge, Newton Crane and Dr. W. A. Rolfe, directors.

The hours of the club will be from 7 a. m. till midnight. The street floor is given over to automobiles. About 100 can be stored in the house upon the two lower floors. The second floor is given over to commodious and inviting reading rooms, reception rooms and a cafe. The furnishings bespeak comfort on every side. The ceiling finish is massive natural oak, while the wall decorations are of tapestry effect. The whole meets with the approval of the most critical clubman.

Club spirit still runs high at Detroit. One of the merriest of all the New Year's parties was that at the home of the Detroit Wheelmen, the large hall being filled by the members and their guests, who danced through the evening and until long after the advent of 1902. The house interior was beautifully decorated, flags and bunting and potted plants being used lavishly.

Riker and Byllesby have Retired

New York, Jan. 6.—"It is a fact," said Mr. Armstrong, of the Electric Vehicle Co. to the MOTOR AGE man to-day, "that Mr. Byllesby and Mr. Riker have resigned from the company; but we desire that it shall be distinctly understood that the relations between them and the company continue to be most cordial. Mr. Byllesby is going into another business entirely distinct from the automobile industry. There is no dispute whatever with Mr. Riker over the ownership of any patents and nothing exists whatever to mar our pleasant relations with these gentlemen."

Has Eisenhuth Failed Again?

Once again the attempted sale of the famous Keating plant, at Middletown, Conn., seems to have failed. Some months ago the receiver, who has been in possession for two years or more, concluded, or supposed he had concluded, negotiation with the Eisenhuth Horseless Carriage Co. to take the plant off his hands, the bondholders agreeing to accept stock in the new concern, with interest at 5 per cent guaranteed for 5 years. The agreement provided that the final action should be taken by the last day of the year, but up to that time nothing definite had been heard of the new concern and it is supposed that it has fallen through. The Eisenhuth concern is the same which made a bid for the Soudan plant, at Elkhart, Ind., but the people interested in the latter were unable to find that the company had anything on which to base the proposed capitalization.

People Coming to Chicago Show

Among the people who have written that they will be in attendance at the Chicago show are the Brown Bros., of Aberdeen, N. D.; E. J. Jones & Co., Arlington Heights, Mass.; W. L. Buck, Luverne, Minn.; Schaefer & Klein, Rochester, N. Y.; E. H. Marriott, La Moille, Ill.; Snider Cycle Co., Indianapolis, Ind.; C. R. Reid,

Piqua, Ohio; J. A. Pallister, Ottumwa, Iowa; M. Staebler, Ann Arbor, Mich.; D. P. Greenlee, Belvidere, Ill.; George W. Mosey, Elwood, Ind., and Planet Bicycle Co., Toronto, Ont.

Electric Vehicle Co's Big Deed

The largest trust deed ever placed on record at Hartford is that filed a few days ago by the Electric Vehicle Co. The amount is \$2,250,000 in favor of the Morton Trust Co., of New York, and was given to provide for the refunding of the company's gold coupon bonds, amounting to \$1,675,000. The papers covered sixty-three large, closely printed pages. The deed covers the company's property at Hartford, the Siemens-Halske factory at Chicago and these stocks: 8,000 shares of the New Haven Carriage Co., fully paid and non-assessable, 2,000 of which are preferred; 70,000 shares in the New York Vehicle Co., par value \$100, of which \$20 is paid on each of 12,000 shares, and \$10 on each of 58,000 shares; 4,000 preferred and 4,000 common stock of the Pennsylvania Electric Vehicle Co., of which the preferred is fully paid and \$10 on each share of the common stock; 40,000 fully paid and non-assessable stock in the Riker Motor Co., of which 10,000 is preferred; 40,000 fully paid of the Washington Electric Vehicle Transportation Co., of New Jersey; 50,000 fully paid of the New England Electric Vehicle Transportation Co.; \$650,000 par value notes of the New York Electric Vehicle Transportation Co., issued September 30, 1901.

Letters of patents in the United States, Great Britain, France, Germany, Belgium, Hungary, Austria, Spain, Italy, Russia, Denmark, Norway, Sweden, Canada, Japan, Australia and New South Wales are part of the trust.

Wants to Race in the Air

Perhaps we shall have a balloon race in connection with the exposition at St. Louis, just to prove that the Missouri city is not so slow. Hiram Maxim, who is now in London, is reported to have said: "I have spent \$100,000 in aerial experiments in the past. If I get an invitation in official form, and the St. Louis managers put up \$200,000 in a bank, I am willing to spend \$100,000 more to win, and thus recoup myself, which I feel reasonably confident I could do." Santos-Dumont and Professor Langley are mentioned as probable competitors for the St. Louis prize.

The Motor Age Directory

Final preparations have been made for the publication of the MOTOR AGE Directory on February 13. Up to date about 500 makers of all sorts of things in connection with automobiles have sent in details of their productions, but there is room for a lot more. There are in the United States not less than 1,000 concerns which are really producing something of interest. There are twice as many getting ready, or in the experimental stages. MOTOR AGE wants only those who will be ready

to supply the goods they manufacture at the time the directory appears.

The directory will be the second annual but will really be the first comprehensive work of its kind ever issued. It will show a complete list of those who make every article required in the business. Makers who have not yet responded to previous invitations are urged to take advantage of this one.

Death of Colonel Cockley

Col. D. L. Cockley, well known as the organizer of the Shelby Tube Co., died at Shelby, O., on Dec. 27, aged 58 years. Only lately he acquired an interest in the Beardsley & Hubbs Mfg. Co., which makes automobiles, and it was due to his influence that the com-



pany moved to Shelby. It was hoped and expected that he would emerge from the comparative retirement into which he had gone since he parted with his interest in the Shelby Tube Co. and would again become a prominent figure in the manufacturing world. His death will be mourned by a large circle of business acquaintances, among whom he was a popular figure.

Result of a Recent Decision

New York, Jan. 6.—The Sperry Battery Co. has caused an injunction to be issued against the National Battery Co., which supplies the many electric vehicles with batteries, from using these batteries and it is reported that they were to-day removed from all the Waverley vehicles. At the International Motor Car Co.'s offices late this afternoon your correspondent was referred to J. C. Sperrill, of the National Battery Co. That gentleman, however, while admitting the truth of an injunction refused to discuss the matter over the phone.

Fire Department Chief Uses a Pierce

During the afternoon of the first day of January, an alarm of fire was rung in from Clark's Hotel, in Boston.

Just at the moment a Pierce motorette was passing the corner of Water and Washington streets, where the chief of the fire department was located. He hailed the operator and asked him to drive to the scene of the fire, and the way the machine tore down Washington street was evidently a surprise to him, for he expressed pleasure at the speed of the vehicle and the ease with which it was controlled, and was particularly delighted at the fact that he arrived on the scene of action fully 2 minutes before any other member of the department. The machine in question was made by the George N. Pierce Co., of Buffalo, and was a duplicate of the one which made such a splendid record in the New York to Buffalo endurance test.

Steam Carriages Entering France

Steam vehicles entering France must have sixteen boiler tubes fixed so that they can be removed, if necessary, in order to examine the interior of the boiler; additional water column; additional safety valve; additional hub brakes on the rear wheels; French gauges reading in atmospheres, with a red arrow to show the point at which the safety valve should blow off, and also what air pressure is considered safe. The import duty is 60 francs per 100 kilos., a kilo. being roughly 2 1-5 pounds, so, assuming that the carriage would weigh about 825 pounds, this would amount to 380 kilos., which would cost about 228 francs, or about \$45.60. This duty would, of course, be refunded when the carriage was taken out of France. The best thing would be for customers to ship their carriages to Barriere & Co., 22 Rue street, Sabin, Paris, who would attend to the duties for them and make the necessary changes at a cost of about \$25.

Plans of the New Merkel Company

The Merkel Mfg. Co., heretofore owned by George Merkel, of Milwaukee, is now incorporated under the laws of Wisconsin. At a meeting of the stockholders Jan. 3 the following officers were elected: Theo. Jonas, president; O. C. Uehling, vice-president; W. J. Merkel, secretary and treasurer; J. F. Merkel, manager. George Merkel, who has been the mainstay of the concern so far, will not take an active part in the business owing to the pressure of other affairs. Mr. Jonas has been a successful bicycle man. His ability as a business man is demonstrated by the fact that he is still in the bicycle business and is doing well.

The new company will continue in the same lines as its predecessor, i. e., bicycle hubs, hydro-carbon motors and motorcycles, and after a short time will build small generating sets consisting of a hydro-carbon motor, directly connected to a dynamo. These are to be used for small lighting plants.

Turnpike Company Asks for Injunction

The South Jersey Transit Co., owning three wagonettes to start with, commenced the operation of its stage line between Bridgeton and Salem, N. J., on Christmas day, having previously tried the vehicles with success.

But now the Salem Turnpike Co. asks to have the operation of the vehicles stopped by legal process, alleging that they leave such a cloud of steam behind that they frighten the horses and that travel on the road is practically suspended in consequence.

The new company has for its officers: President, William O. Garrison; secretary, Clement W. Shoemaker; treasurer, Walter H. Bacon. Considerable capital has been invested in the undertaking.

Plans for the Chicago automobile colony, at Fourteenth street and Michigan avenue, are complete and some machines will be placed there before the week ends. The machines to be handled there are the Winton, by C. H. Tucker; Packard, Baker and Victor, by Col. Pardee; Toledo and Waverley, by W. L. Githens, and the Milwaukee, by the company's local branch. Most of these concerns expect to have some machines there to display in a day or two, although the premises will not be in final shape for some time.

Herbert A. Githens, one of the old reliable brigade in cycling, will represent G. & J. bicycle and automobile tires on the road. Githens was a champion when high wheels were used and his name figured on the record sheet. Later he was with Gormully & Jeffery and later still managed a branch of the A. B. C. at Cleveland. He is an extremely popular man in the trade and a fitting representative of a high-grade house.

Here is a cheerful communication from J. H. Bailey, of Pueblo, Col., who asks MOTOR AGE catalogue department to help him: "I am in the market for an electric vehicle which will be run about 15 miles every day in the year on the worst roads the law ever permitted to be called roads. Will you please send me catalogues of machines which you can recommend for this work?"

If money were all that were needed to carry on the work of government, the Automobile Club of America could probably succeed. It received about \$10,000 as its share of the proceeds of the New York show, has an income of \$15,000 a year from dues, and adds to this about \$10,000 a year from initiation fees.

A new tonneau machine is passing through the shops of the Century company of Syracuse. It will be rated at a maximum speed of 35 miles an hour. Two forward speeds and a reverse and a 12-horsepower four-cylinder motor are among the features of the new machine, which will weigh 1,600 pounds.

New York is to be blessed—if that is the correct word—with still another automobile paper. It is understood that it will be a monthly, of magazine form, and that a well known advertising agency will be intimately connected with it.

J. M. Crawford, Jr., whose address is box 72, Lockway, Floyd county, Tex., is anxious to receive information relative to automobiles for trucking purposes. He wants something of about 30 horsepower for use on the plains of Texas.

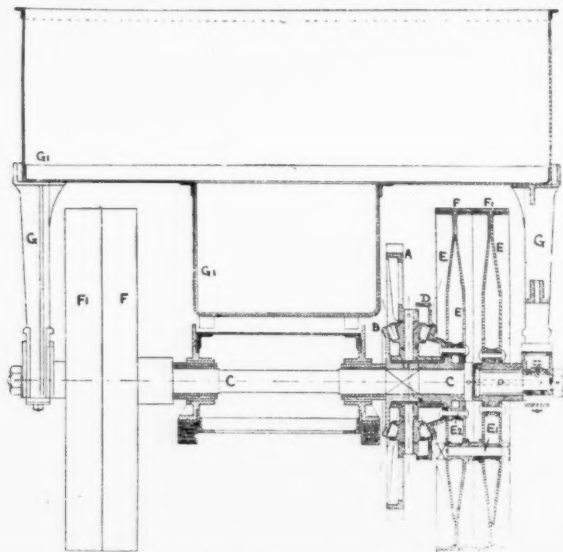
E. Q. Williams, 318 East Water street, Syracuse, is manufacturing spark coils and seeking to establish connections in the automobile business.

THE HEAVY MOTOR WAGONS OF GREAT BRITAIN

NUMBER SIX

SILVER medals were awarded to two vehicles made by the Mann Patent Steam Cart & Wagon Co., of Leeds. Apparently the only reason they were not placed in the gold medal class was that they are not, as required by the rules of the trials, "so constructed that no smoke or visible vapor is emitted except from temporary or accidental cause." They are, nevertheless, eminently suited for some kinds of heavy work where visible steam and smoke are unimportant.

In the tipping cart the engine is fixed upon the top of the boiler. The crank shaft carries a pinion wheel at each end and a flywheel outside the pinion on the left hand side. A first countershaft lies across the machine parallel with, but below and behind, the crank



SECTION THROUGH REAR AXLE OF MANN STEAM CART.

shaft; two spur wheels are so arranged upon this countershaft that either can be brought in gear with its corresponding pinion on the crank shaft. A second countershaft is driven by this first one, and it in turn drives a large spur wheel, A, upon the differential gear. A band brake acts upon a drum on this countershaft.

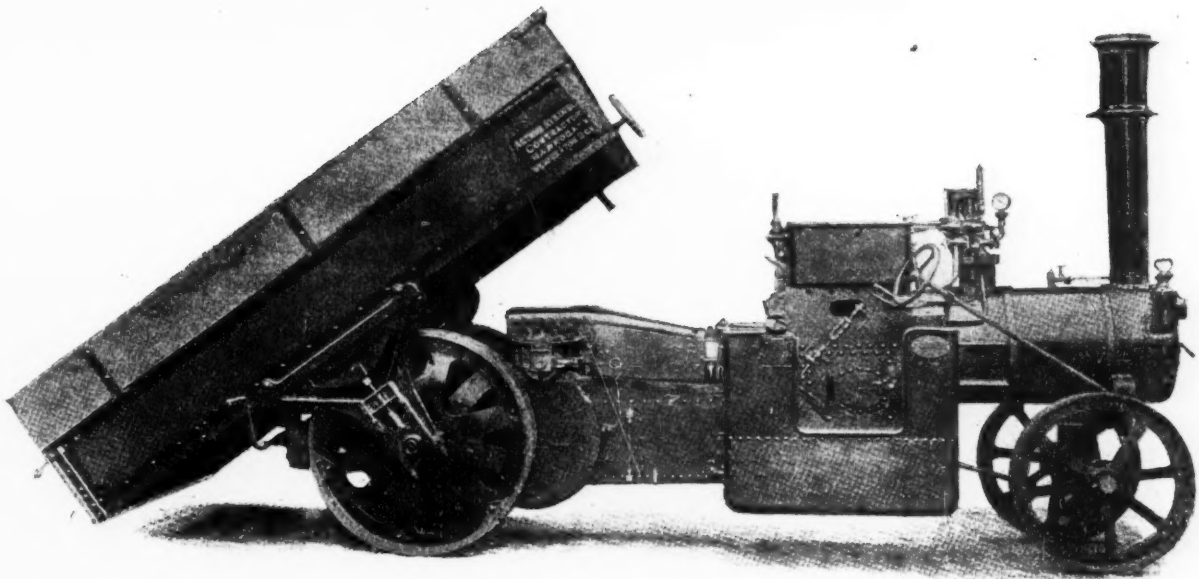
The rear axle, C, is $3\frac{1}{2}$ inches in diameter, and it passes from the left hand driving wheel, F (which is fixed to it), through the right hand wheel, F, to an outside thrust collar. The bevel wheel, B, of the differential is fixed to it on a squared portion, and the bevel wheel, D, with its right hand driving wheel, runs

freely upon it. The bevel, D, is provided with a brake drum, D, and the spur wheel, A, carries a divided brake band (not shown), which can be tightened so as to lock the differential gear when desired. The cart body, G 1, is carried by hornplates, G, upon its own wheels, F 1, and these wheels can be rigidly pinned to the driving wheels, F, by the bolts, E 1.

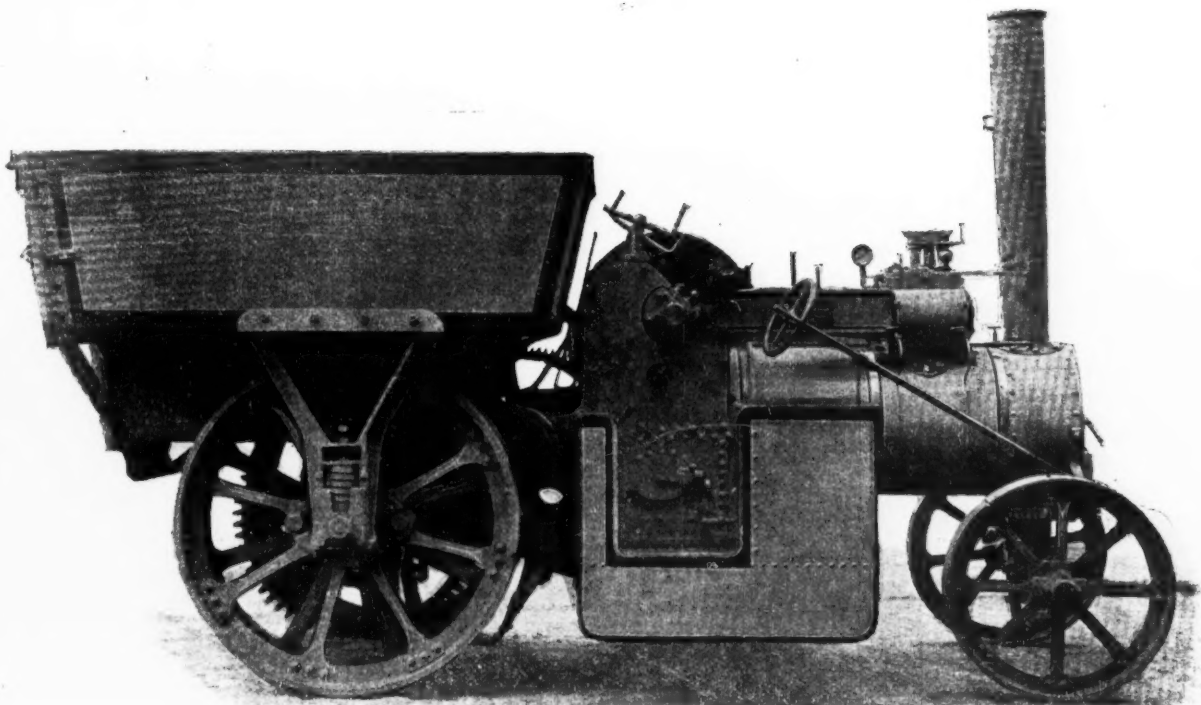
The wheels are each built up of two steel plates, are curved as shown and are cut out so as to form strong spokes. These plates are connected by a central cast steel boss or hub, to which they are riveted (E 2), and by a wide steel tire, which is similarly fixed in place. The wheels, F, are so made that the pins, E 1, pass through specially-provided portions which come between their ordinary spokes, but in the wheels, F 1, the pins pass through the center of the spokes; by this arrangement the strength of the double wheel is increased in consequence of the spokes of the inner and outer wheels failing to come opposite each other. The wheels are 4 feet in diameter and each single wheel weighs about 450 pounds and is 5 inches wide.

In the lorry the engine is fixed above a large water tank, formed by the frame between the boiler and the driving wheels. The crank shaft carries a pair of pinion wheels on its right-hand end. Either of two corresponding spur wheels on a countershaft can be brought into gear with one of these, and the countershaft drives the large spur wheel upon the differential gear. In this vehicle the engine, which is fitted with an oil bath casing, can be easily got at, when required, by tipping the balanced lorry about its stub axles. The rear axle and the driving wheels are very similar to those above described, except that the latter are 3 feet 6 inches in diameter. The sides of the framework are made in one piece with the side plates of the fire-box, and the bearings are made to register accurately into these plates; long bronze bearing surfaces are provided for the crank and counter shafts and these are supported in steel castings which are bolted to the frame, as well as being turned to fit the holes bored in it. The front axle is mounted centrally in hornplates, and is fitted with a traverse spring; the whole of this is carried by a turntable beneath the boiler, and steering is effected by a sloping hand-wheel and through worm gearing.

The reversing gear adopted for all the engines is shown in the drawings where it will be seen that a single eccentric is so arranged that it can be shifted from a forward to a backward position without altering the lead. Its action is similar to that of an ordi-



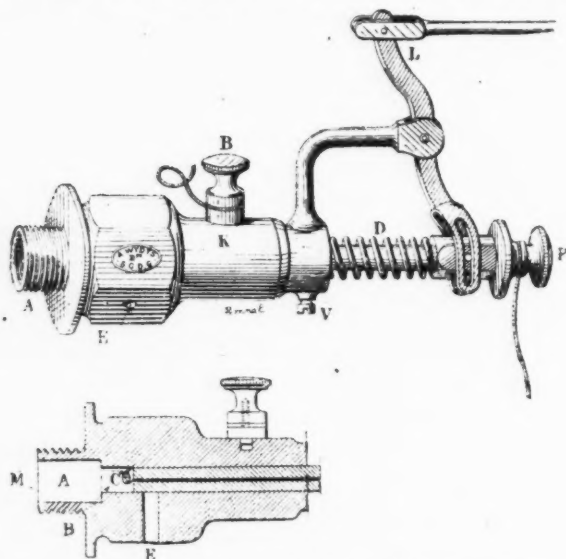
THE MANN STEAM LURRY.



THE MANN STEAM CART.

nary parallel ruler, and the eccentric block in any of its positions always remains at right angles to the crank shaft, and parallel to the center line of the engine. A is a wheel which is keyed to the crank shaft, and has four lugs cast upon it. The lugs receive pins which act as fulcrums for a bell-crank lever, B, and a distance link, C, both of which have pin centers of exactly equal length and are the same depth as the diameter of the shaft. The eccentric block, D, has similar lugs to those on the fixed wheel A, and is also connected to the lever, B, and the link, C. A sliding sleeve, E, which engages with the other end of the bell-crank, B, is free to move along the shaft, and is controlled by the hand-lever. This simple mechanism has been found very satisfactory in practice, and it has been in use for some little time. The makers point out that the cut-off can be altered by notching up in the usual way, but that there are no moving parts when the engine is running, and only a very slight motion when it is reversed.

Squares are formed for fixing the various gear wheels



THE WYDTS ELECTRO-CATALYTICAL IGNITER.

upon their shafts. A pinion is mounted upon a hand-actuated shaft in such a way that it can be brought into mesh with gearing on the fly-wheel when it is necessary to move the wagon a short distance and when the boiler is not under steam. A steam water lifter with a long hose pipe is fitted near the water tank. No attempt is made to drain any condensed water back into the tanks, but, on the contrary, and on principle, Mr. Mann has made every provision for enabling it to escape. The water supply is sufficient for running about 8 or 10 miles without replenishing.

The Wydts Electro-Catalytical Igniter

It has been demonstrated that several metals such as osmium, vidium, rhodium and ruthenium have the singular and heretofore poorly-explained property of igniting gas mixtures with which they come in con-

tact under certain conditions. This power, described as catalytical, is increased with the surface of the metal in contact with the gases. For instance, to ignite a hydro-carbon mixture, osmium must be heated to 390 degrees when in a compact piece, to 100 degrees or 120 degrees when spongy, and not at all when powdered.

Following this principle, and after great research Mr. Wydts, of Paris, succeeded in constructing an electro-catalytical igniter. He uses an alloy of osmium and ruthenium, which contributes an extremely porous though always dense metal, having the power to condense the hydrogen carbides with rising of temperature. Mr. Wydts further discovered that the passing of a low electric current (1 volt and 0.5 ampere or one-half watt) would greatly facilitate the ignition. The Wydts igniter is constructed as follows:

A cylindrical bronze piece V is screwed in M on the cylinder of the motor in place of the ordinary plug and by means of a lever L the driver can slide a metallic piston D, holding an insulated wire terminating at the binding post P. The piston bears at its extremity, on the gas intake side, a wire of the alloy, which is mounted on the inner insulated stem and on the piston's extremity and which, by touching the sides of the plug, receives the current from the binding post B. Thus by connecting the posts B and P the current will pass through the osmium wire. By means of the switch E the current can be cut off when desired. The current necessary is very low, a single cell only being used. The incandescence of the wire increases up to 1,700 degrees.

Late Incorporations and Enterprises

Hansen Automobile Co., Columbus, O., capital stock, \$10,000, by Rasmur Hansen, J. T. Dickson, A. L. Wight, H. W. Trash and E. E. Homer.

The Jewett Motor Carriage Co., of Jewett, Harrison county, Ohio, has been incorporated with a capital of \$25,000.

The Toledo Machine & Motor Co. commenced operations on the first of the year. It will make automobile and marine motors.

Robbers in an Automobile Store

The P. J. Dasey Co., 19 and 21 La Salle street, Chicago, had an experience with daylight robbers on Thursday of this week that ended disastrously for two men implicated in the attempt. The men entered the store and remarked that they desired to stand in out of the cold while waiting for a friend. When the backs of the attendants were turned, a Dow coil was abstracted from a pile on a shelf. Quick action on the part of the proprietors secured not only the return of the coil but the company of the thieves as well until the arrival of an officer, who removed the intruders to the central station, where they were booked on the charge of burglary. The whole matter, from the time of detection until the men were safe behind the bars, occupied but 20 minutes.

NEWS, NOTES AND COMMENTS FROM NEW YORK

NEW YORK, Jan. 5.—Secretary Butler, of the Automobile Club of America, says the affiliation agreement is only awaiting the printer, final approval, correction or something else before being sent out in a day or two. It has been awaiting that something or other for a month or more. Mr. Butler is a most faithful, discreet and popular secretary, and it wouldn't do for him to say anything that might lead to an admission that any hitch had hindered the much-discussed document's progress to the postoffice, much less that an interment, temporary or permanent, had befallen it. A newspaper man, but no one else, has a kick coming against Mr. Butler. Another rumor has it that some members of the opposition are to precipitate a discussion of it at the regular weekly club night on Tuesday. This would seem improbable, as these gatherings are merely informal and in no sense club meetings for the transaction of business.

* * *

The real situation seems to be that the affiliation scheme, with its national and parental assumption, is the pet creation of President Shattuck and a coterie of his friends now in the ascendant in the board of governors; that the membership at large is too much engrossed by financial duties and social interests to care about an affiliation, a national association or any other form of national motor vehicle government; and that the contingent of active members in opposition to the untenable and impracticable project either lacks courage or a leader to make a fight against it, or prefers to let President Shattuck and the other governors responsible for the break extricate themselves from their predicament as best they can.

* * *

It is said that tentative letters have been sent out to the clubs to sound their sentiment on the subject, and that this canvass leaves only the Syracuse, Bridgeport and North Jersey clubs as certain to accept the nationality and paternity of the Automobile Club of America. It would seem that the opposition, in which is numbered some of the most active and talented members of the club, is not likely to take any action whatever toward bringing the matter to a general club discussion until something happens to precipitate it. It is very generally remarked that the popularity of the club and the regard automobilists have for it as the pioneer organization and the promoter of many schemes for the good of the sport and the industry have been notably proved by the gentle handling the press and even the opponents generally of the scheme have given an idea that is really too ridiculous and repugnant for general acceptance by Americans.

There would seem to be a chance for some Joshua to arise in the club to lead it out of the Egypt of its predicament and to maintain its prestige by the promulgation of a plan of national government, which the clubs would gladly accept as rightfully coming from the pioneer and largest automobile organization in America. The outside clubs have certainly been patient in not long ere this taking the initiative and promulgating a scheme for a national association without further awaiting the leadership of the New York club in the matter.

* * *

The silver cups won in the completed classes in the mile straightaway time trials of the Long Island Automobile Club will be ready for delivery in a few days. They will go to Henri Fournier (Mors) in the heavy gasoline class; to Jacques Longuez (De Dion motor-ette) in the light gasoline class; to S. T. Davis, jr. (Locomobile), in the steam class, and to A. L. Riker (Electric Vehicle Co.) in the electric class. It is proposed to run off the uncompleted motor bicycle, motor tricycle and middle-weight gasoline classes in connection with the second annual 100-mile endurance run and first annual hill climbing contest scheduled for early next May. The championship final will also be run off that day.

* * *

The law committee of the Automobile Club of America is now in correspondence with the Canadian treasury officials in furtherance of the suggestion of George F. Chamberlain, chairman of the committee, that an effort be made to secure for automobilists the same privileges touring cyclists enjoy in being permitted to take their machines across the border without paying duty and taking a receipt as required of foreigners crossing the ocean with their vehicles. In the case of the cyclists, the Canadian government took the initiative, and so the Dominion government is being first approached in the matter. After the preliminaries have been arranged the club will send an emissary to conclude the final details. The promulgation of the Canadian regulations accomplished, the Washington authorities will next be approached with little fear of an unfavorable response.

* * *

A. G. Batchelder, chairman of the Board of Control of the National Cycling Association, and cycling and automobile editor of the New York Journal, and John H. Gerrie, cycling and automobile editor of the New York Herald, through their counsel, Isaac B. Porter, former president of the League of American Wheelmen, have brought suits for \$20,000 damages each against the Long

Island Railroad for injuries received owing to the company's alleged negligence in giving suitable warning of approaching trains at the Westbury, L. I., crossing, sustained in the accident to Henri Fournier's auto party last October. Each was laid up at a hospital and at home for over a month, and Mr. Batchelder has only recently been able to abandon his crutches for a cane. The owner of the automobile, which was completely demolished, also brings suit, and so do two other members of the party that day.

Automobilists, bicyclists and horse owners are to unite in a crusade against the excessive street sprinkling nuisance, whereby accidents and escapes are frequent to users of the three classes of vehicles. The Associated Cycling Clubs and the Road Drivers' Association of New York appointed committees, which went to the Automobile Club of America on Friday afternoon to meet President Shattuck, who was to represent his club, but failed to appear owing to a misunderstanding as to the date. The conference adjourned to meet at the Century Wheelmen's Club house next Friday afternoon.

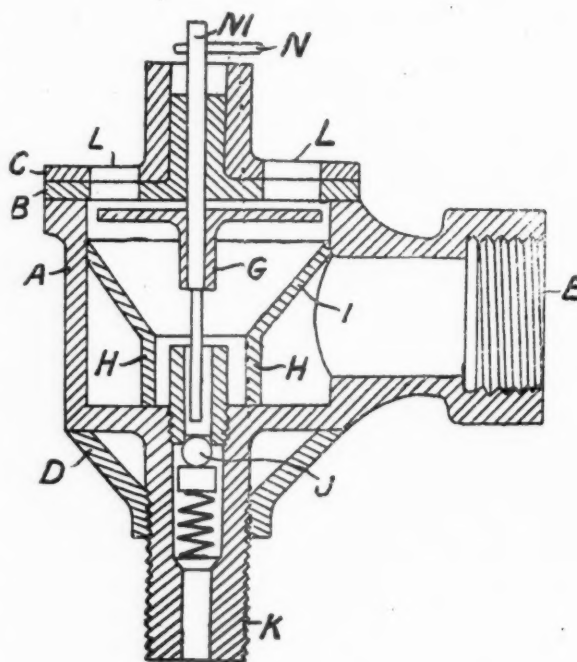
The Nassau county, Long Island, farmers have it in for the automobilists and are calling on their supervisors to have a more stringent speed bill put through the next legislature on an introduction by Senator Cocks, of that county. This has brought about several conferences between President Shattuck, Senator Cocks and one or two members of the A. C. A. law committee. The matter, however, has probably been satisfactorily arranged by a conference between Fred Ingraham, counsel of the Nassau county supervisors, and Judge James C. Church, of the law committee.

"The Nassau county people," said Judge Church to the MOTOR AGE man this afternoon, "drew the present bill and now discover that the \$25 fine imposed can only be collected by a civil action. The anti-automobilists now demand that the supervisors prepare a bill making a violation of the law a misdemeanor. The club has no objection to the law being changed so that a violation accompanied by an actual injury to a passing vehicle or to foot passenger at a crossing or walking on the road be made a misdemeanor; but think it unfair to make a mere excess of speed without any damage a misdemeanor carrying with it possible imprisonment. Mr. Ingraham seems disposed to accept this reasonable suggestion and to incorporate it in the amendment Senator Cocks will be asked to introduce. I know of no adverse legislation threatened from any other quarter."

T. H. Hastings, the well known automobile photographer, is organizing a club in the Flatbush section of Brooklyn, to be made up of automobile owners exclusively and to bar altogether from membership any one connected with the trade. It will start with a membership of from ten to fifteen. Mr. Hastings, by the way, is to give an automobile euchre party, to which all the guests will come a-motor.

THE CALVERT CARBURETER

Here is a carbureter designed by G. Calvert, a Londoner, which consists of the main casting A, cover plate B, regulator plate C, plunger plate G, mixing cone I, and exhaust jacket D. The action is as follows: The ball valve J, controlling the supply of the spirit, is normally kept firmly in place by a small spring. Upon air being drawn in through the inlets L L, it strikes upon the plunger plate G, which is fixed to the rod M, and, through M, depresses J, allowing a small quantity of gasoline to enter the mixing cone I, where it is mixed with the air, and drawn through the holes H H and the pipe E to the explosion chamber. The cover plate C is made to turn on the pin in the center B, so that it can open or cover the holes L L at will. A pin N is driven into hole in M, so that it just touches the



THE CALVERT CARBURETER.

top of the outer tube on C. A spiral is cut on the top of this tube, so that as the air inlets are closed moving C, the spiral allows M to drop more, thus varying the mixture in inverse proportions. M G is prevented from turning by fixing a small pin on inside of B, and allowing it to work freely through a hole in G. The exhaust cone D is tapped through the center, and screwed on to K to make a faced joint with A, and forms a small annular chamber, through which a portion of the exhaust gases is made to pass to warm the gasoline and assist carburation in cold weather. The carbureter is made in sizes for engines up to 2½ horsepower, the main feature, as above described, being that the amount of gasoline allowed to pass is controlled automatically by the regulation of the air inlet.

WHY THE PRICES OF AUTOMOBILES GO UP

Details of the Progress of Manufacture of Which the Public
Knows Nothing—Able Article on the Cost of
Special Machines

WHY, some of the newspapers want to know, have the prices of automobiles gone up instead of down? There is general confusion among that class of writers which, ever on the lookout for something or somebody to berate, finds its calculations awry. The complainants resent the fact that automobiles have not decreased in price, "just like the bicycle." These people have forgotten—or perhaps they never knew—that the bicycle had been introduced many years before there was any considerable reduction in prices. Just as has happened in the case of the automobile, the prices of cycles went up instead of down after the first year or two of manufacture. And to a man who understands anything about either business the reasons are obvious.

In the late seventies the bicycle came on the market, a complete novelty. People had but just learned that it was a possibility for a man to balance himself on two wheels. Machines weighed a ton—figuratively—and methods of manufacture were a serious problem. The makers were confronted with a demand for simplicity, strength, lightness and easy running. They set about developing them and spent money by the car load doing it. The public had to pay for it. As improvements developed production became more costly. The plain bearing had to give way to the easier running ball bearing which cost a great deal more to make. A good ball bearing cost about as much in those days as a complete bicycle does today. The method of producing the balls was laborious and known to few. Other parts, calling for the utmost care in manufacture, were made in ways which would be laughed at today. But, as everything must have a beginning, so the cycle manufacturer, by the expenditure of his money, developed something better.

For a long time the makers were at sea as to what would be the ultimate form of the successful bicycle. It took them years to find out. Finally they did it. Then they were in a position to make goods in such quantities that they could produce more cheaply. Having tried all the parts they were able to devise special machinery for each. Then came the day of specialization. Makers who had openly boasted of the fact that all the parts of the machine were made in their own factories would have been ashamed, later on, to have made such a claim. Makers of parts came into the field and specialized. By devoting their entire time and attention to the manufacture of some one part they were able to produce it better than the man who tried to make it in connection with a hundred other things, and at a lower price. The maker of bicycles could no longer afford to make his own parts. There

are still factories which are the graveyards of machinery designed to make certain parts but, despite the great amount of money invested in them, discarded because some other factory could produce the same parts better, quicker and cheaper. And so the prices came down.

* * *

Until the same thing has gone into history in the automobile trade the prices will not be reduced. In the cases of some machines they will never be reduced. The automobile maker is still in an unsettled state. He is not absolutely certain that the present form of machine will last. He doesn't know that some other machine will not be introduced which will be voted the proper thing. If he did he would be in a position to put in machinery enough and employ men enough to swamp the country with automobiles at almost any price the public might demand. In other words the machines made by the makers of today are the best things which it is possible to produce in the present state of the art. That there will be changes and improvements in the next few years is ascertain as death and taxes. The cheap man will have to wait a long time for a ride if he delays his purchase until finality has been reached and makers are prepared to make a machine for him at any price he wishes to pay.

* * *

This line of thought was suggested by the reading of an able paper prepared by J. T. Broderick, and published in the Engineering Magazine, on "The Standardization of Electrical Apparatus." The keynote of the paper is sounded by the editor in a note at the commencement of the work, in which he says:

"In the following article, Mr. Broderick takes up the discussion of the important opportunities for economy presented by present conditions in the electrical manufacturing trade. The comparative youth of the industry is sufficient explanation of its lack of settled standards; but much of the diversity of detail, dimension and pattern might be simplified, to the great advantage of both manufacturer and consumer. In this paper the view-point taken is that of the maker. A sequel will show how the user's interests are concerned."

Without going at too great length into the detail of Mr. Broderick's paper it may be well to quote a few of the suggestions he offers as to the cost of manufacturing special machines. Assuming, he says, the highest practicable degree of productive economy attained in the case of standard machines made in large quantities, and assuming further that in such case the absolute cost of a given machine is \$100, it may be said that the absolute cost of a special machine is increased over and above this amount, because of its being special, for the following reasons:

* * *

First, the cost of the investment required in connection with the manufacture of a special machine is greater and the investment is utilized at a much lower degree of economy. More floor space is required, and the space allotted is needed for a longer period. Special

tool fixtures, such as jigs, blocks, cutters and boring bars, may be needed; or, if standard fixtures are employed, in adapting them for service on special parts they are destroyed or their efficiency for service on standard work is impaired. It is easy to see how specialization affects the economy of tools by conceiving of a machine-shop installation consisting of a milling machine, a drill press, a boring machine, and a grinding machine. These four tools, we will say, are today employed on standard work, each one performing its peculiar operation, the drill press taking the work from the milling machine, the boring machine taking it from the drill press, and the grinding machine taking it from the boring machine, with clock-work regularity and continuity and at the highest attainable degree of economy. Tomorrow some operation in connection with the manufacture of a special generator or motor requires to be performed. Numerous letters and telegrams have been received urging that its delivery be hastened and that, if necessary, it be given the right of way in production. The drill press, in the group of four machines just described, happens to be the most suitable tool in the plant with which to perform the work; there is nothing to do but to utilize it, and as a consequence, the milling machine, the boring machine and the grinding machine are temporarily thrown out of service. To avoid such a condition, spare facilities for emergency purposes must be provided or overtime work done with the drill press. Either method involves extra expense. No practicable plan has ever been devised by which the extra expense incurred by reason of the additional investment, of the destruction of fixtures or their impairment for use on standard work, and of the reduced efficiency in the utilization of tools, can be wholly included in the cost of a given piece of special apparatus.

* * *

Second, the direct labor cost of a special machine is bound to be considerably higher than that of a standard machine. The utmost care being required, this labor must necessarily be done by the most skilful and best paid mechanics and frequently by the day-rate method, which has been found from experience to be considerably less economical than piece work. A greater amount of labor is also entailed, the tools employed requiring to be dismantled, either wholly or in part, and provided with fixtures suitable for the special work to be done.

* * *

Third, the loss due to waste of material is greater in connection with the manufacture of a special machine. The raw material entering into the construction of a standard machine may be ordered ahead in large quantities and taken from the stock room in the shapes and sizes in which it is used. The raw material entering into the construction of a special machine must either be specially ordered or made up from stock on hand. When it is specially ordered a surplus may be secured, as an insurance against spoiled work, and in most cases no use can be made of this surplus and it becomes

necessary sooner or later to dispose of it as scrap. Making up the parts required from available stock is an expensive process. For example, a generator shaft of odd shape and dimensions may be needed. To secure this shaft it may be necessary to take from stock a larger shaft and machine it to the shape and dimensions required, thus wasting a certain amount of material.

* * *

Fourth, a special machine requires a greater amount of general or operating expense in connection with its manufacture than a standard machine. Vastly more superintendence and clerical labor are needed in the shop, and there is an inevitable consumption of a certain amount of the time of every one concerned, from the executive officer or manager, who must express an opinion or pass judgment on the many doubtful points that are sure to arise, to the messenger who carries the written instructions or information from place to place. The expenses for testing are also likely to be greater, tests of longer duration and greater variety often being essential in order to satisfy the designer that the exceptional guarantees specified have been fulfilled and that the machine will operate satisfactorily. In addition, more expense is incurred in preparing a special machine for shipment. Extra quantities of packing material and lumber are frequently necessary, and extra supervision and labor are required in packing and boxing and, in the case of large apparatus, in loading the apparatus on cars and providing it with suitable supports.

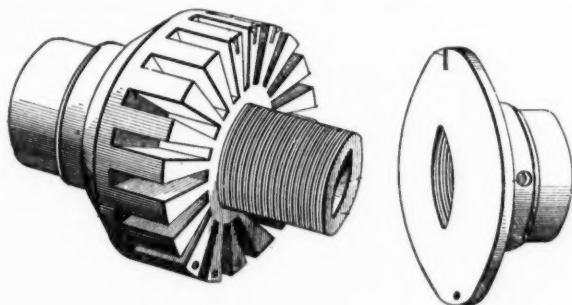
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It may be assumed that, inasmuch as the charges for both labor and material are greater in the case of a special machine, and the percentage for general expense is added either to the charge for labor or to the sum of the charges for labor and material, as already explained, the extra general expense is taken care of automatically. It will be seen, by bearing in mind the effect which special apparatus has on the cost of standard apparatus, that this can be only partially true. As already shown, it is impossible to apportion general expense with strict accuracy over the many types and the many modifications of these types with which manufacturers of electrical apparatus must deal. A percentage must be employed; and it is therefore evident that without a system of accounting so elaborate that in itself it would be most uneconomical, the cost of standard apparatus must be burdened with a portion of the extra general expense incident to the manufacture of special apparatus. Hence, an increase in the proportion of special apparatus must either increase the cost of standard apparatus or prevent reductions in its cost.

Among the most consistent pushers of American vehicles abroad are the Shippey Bros., of London. They represent the Milwaukee Automobile Co., which has just shipped them a carload of vehicles. The Milwaukee company states, positively, that it will not remove from that city.

LATE EFFORTS OF DESIGNERS AND INVENTORS

O. F. Miller, of Dallas, Pa., has recently invented a hub for vehicle wheels the object of which is to facilitate the renewal of worn or broken spokes without removing the tire or felly. The construction of the



hub is simple, it being formed of two elements, preferably of metal and each cast in one piece. The main or inner portion of the hub is mortised radially to provide seats or sockets for the spokes and the cylindrical extension or barrel is externally threaded to receive the internally threaded bore of the outer member.

The outer portion is merely a flanged sleeve, the outer periphery of which coincides with the periphery of the mortised flange of the inner member and is screwed to its seat by a spanner wrench and held against displacement by a key, seats for which are provided in the inner face of the flange and in the outer faces of the walls between the spoke seats. The bearings may be placed within the barrel of the hub secured to the axle in any desired manner.

Novel Body Construction

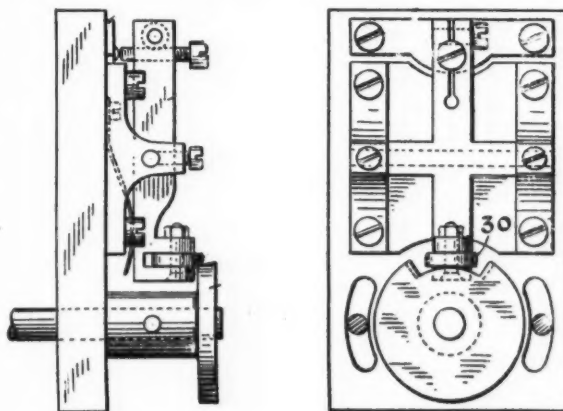
Frank Knobel, a carriage builder of Wiedenbruck, Germany, has secured letters patent in the United States covering a carriage body comprising a framework of angle iron covered with a wood shell to the exterior of the wooden shell and in alignment with the angle iron frame members are secured, by means of screws or rivets, metal tubes, semi-circular in cross section. No particular form of body is covered in the claims, only the particular method of construction being given attention.

Boisselot Igniting Regulator

J. B. Boisselot, of New York, has obtained a patent on an electric ignition regulator or contact breaker the essential features of which are a rocker arm provided with an adjustable contact point, a plate which serves as an opposite electrode and an operating cam by

which the rocker arm is moved in and out of contact. The base of the apparatus is a block of indurated wood or fiber secured to the motor in such a way that it may be rotated around the actuating cam to limited extent for the purpose of advancing or retarding the spark. Secured to the base is a bracket between the arms of which is mounted the rocker arm. One end of this arm carries a platinum pointed contact screw adapted to meet a like pointed terminal secured to the fiber base. The other end of the arm supports an anti-friction roll arranged in the path of the rotating cam and held against the cam by a spring underlying the rocker arm and pressing against the base.

The cam is in the form of a disk from which a segment is cut away in the path of the roller so that while the outer end of the arm and the contact point carried by it is normally held out of contact with the opposite terminal when the opening in the disk comes opposite the roller the arm is allowed to swing in con-

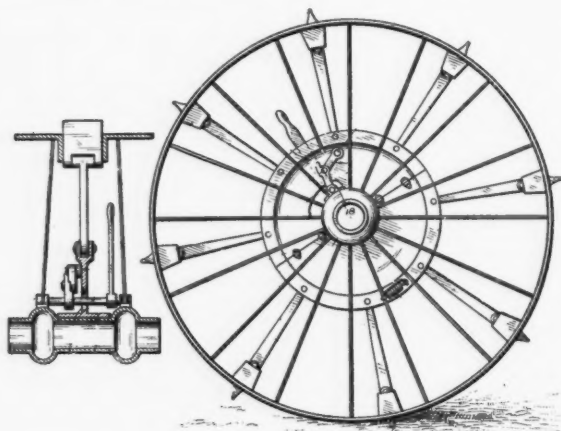


tact and is immediately thrown out of contact when the solid portion of the cam again comes in contact with the roller. It will be readily understood that this device is for making and breaking the primary circuit for the jump spark type of ignition.

A Non-Splitting Traction Wheel

G. A. Tauer, of New Ulm, Minn., has invented a traction wheel designed for slippery or muddy roads in which the periphery is provided with a number of radiably movable shoes so arranged that they may be moved outwardly when needed and drawn in flush with the rim of the wheel when not required. The hub is provided with a cylindrical barrel on which is rotatably seated a centrally located disk for a purpose to be described. This disk has a channeled or double flanged

rim between the flanges of which is pivotally secured a series of links the outer ends of which are pivotally secured to a corresponding number of radially movable claws or hooks. Each of these claws or hooks is substantially rectangular in cross section and is slidably mounted in correspondingly shaped sleeve or housing connected fixedly to the inner surface of the rim and extending radially inward therefrom.



In order to provide for oscillating the disk a rock-shaft is transversely mounted on bearings on the hub and is provided with a rigidly mounted operating lever set near one side of the hub. The shaft is connected with the disk by means of a pair of toggle links so that by movement of the shaft the disk may be rotated, thus causing the claws to project outwardly from the rim or be drawn in flush with the periphery as desired. There is no provision for elastic tires on the wheel and the device is intended principally for use on dirt or sandy roads, and is mainly adaptable to heavy vehicles for freighting.

Olds Running Gear Patent

Ransom E. Olds, of Detroit, Mich., has been recently granted a patent covering the well known spring running gear used in the Oldsmobile.

The points to which particular attention is given are the general construction of the frame, which consists of two longitudinally disposed springs, comprising a straight horizontal middle section and extending to the front and rear with a downward inclination, and a motor frame, preferably of angle iron, rigidly secured to the central portion of the springs. The methods used in securing the springs to the axles and the body of the vehicle are also covered in detail.

The rear axle is secured to the spring arms by fittings specially designed to adjust the tension of the driving chain. Each of these fittings comprised a split ring embracing the axle casing and having formed therein a socket for receiving the end of the spring arm. A clamping bolt is provided for drawing the two sections of the fitting together, the arrangement being such that the tightening of the bolts will clamp both the fitting

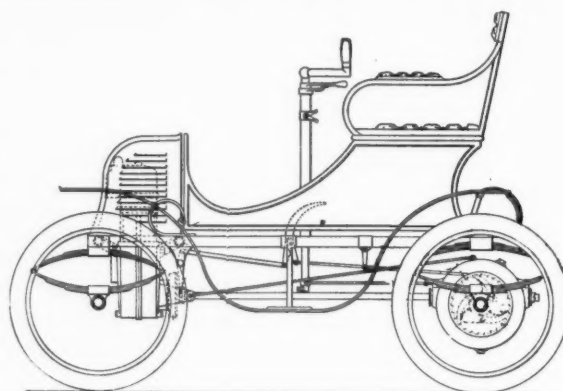
to the axle casing and the spring in its socket. At the rear or outer end of the socket is arranged a screw adapted to bear against the end of the spring arm, forming an adjusting means for tightening the drive chain from the motor to the compensating gear.

The body of the vehicle is supported from the motor frame and has a yielding connection therewith. This connection comprises a bracket, in the form of an inverted L secured to the motor frame. The horizontally extending portion of the bracket is apertured to receive a vertically disposed bolt that is secured to the sill of the body either by passing through it or through a plate bolted to the sill. Sleeved upon the bolt, at opposite sides of the bracket, are elastic washers or cushions. With the construction above described the body is permitted to oscillate vertically by the spring arms connecting it to the axles and at the same time the body is also free to have a limited movement independent of the vehicle frame.

To provide for the vertical flexibility of the steering apparatus an elliptical spring is introduced in the steering post between the frame and the front axle, and while it is sufficiently stiff to transmit a rotary motion of the steering post, the required allowance is made for vertical play. This detail is not covered in the patent claims but is described in full in the specifications and is a part of the standard construction of the Oldsmobile.

An English Light Carriage

John Ridley, of Coventry, England, has secured an American patent covering the essential features of a neat appearing light carriage. The motor, which may be a gasoline engine of any preferred pattern, is located close behind the rear axle in such a position that the crank shaft sets longitudinally of the vehicle. The



motion of the crank shaft is conveyed through a friction clutch to a driving axle which has a friction clutch at its forward end. The friction clutch is controlled by a foot lever acting upon a grooved collar connected to the convex part of the clutch. No compensating gear is used and a single piece driving axle is employed which extends from outside to outside of the driving wheels.

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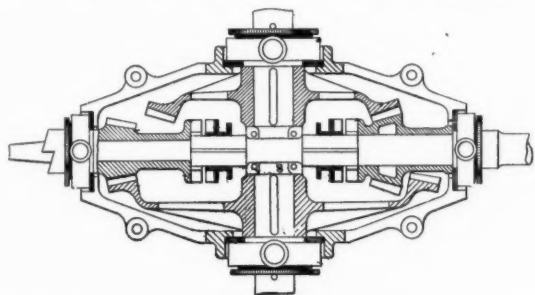
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THE MOTOR AGE

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traveling in other than a straight line the wheels are connected to the axle by means of ratchets and pawls forming a one-way clutch. When traveling in a straight line both wheels drive, but when making turns the inner wheel alone drives, while the outer wheel overruns. The boxes of the clutches are fixed to the wheels



and their outer peripheries are employed as brake drums. Motion is transmitted from the longitudinal axle to the main driving axle by means of two bevel gears on the former adapted to gear positively, one at a time, with bevel gear wheels on the latter.

In order to put either of the pairs of gears into action as desired the large gear wheels are fixed to the main driving axle, while the two pinions are loosely seated on the longitudinal shaft on which are mounted so as to rotate therewith two slidable jaw clutches. These slidable clutches are adapted to engage with suitable jawed bosses on the bevel pinions and are provided with grooved collars adapted to receive the forked ends of a yoke which may be operated, through suitable connections, by a lever mounted below the steering handle.

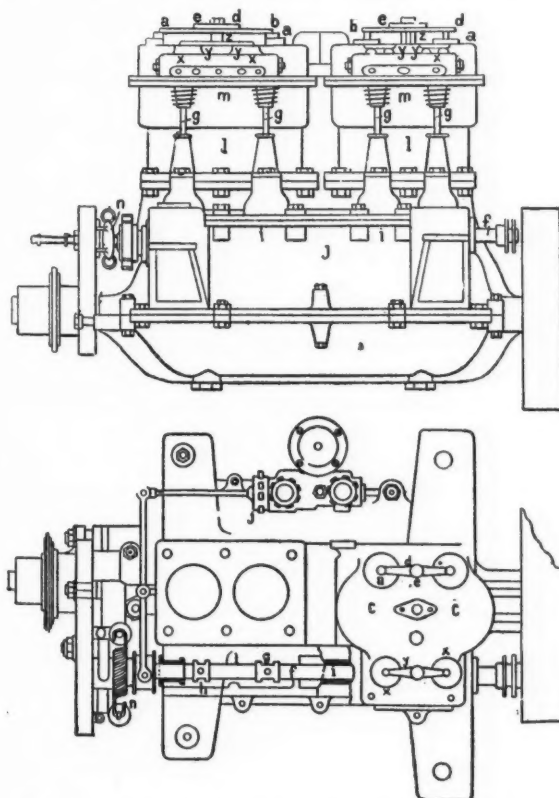
By a longitudinal movement either of the pairs of gears may be thrown into use or both may be left free and the carriage out of gear with the motor by leaving the clutch in an intermediate position, as shown in the illustration.

As the two perpendicularly disposed axles, in order to clear each other, must necessarily lie in different planes the gear wheels on the main driving axle are provided with skew teeth set at a suitable angle. The objectionable features, or at least the weak points of the carriage, are the lack of a backward drive and the sudden placing of a heavy load on the motor in turning a curve of any abruptness.

The New Centaur Motor

While the Panhard people have heretofore given attention to methods of governing the speed of their motors by means of exhaust governors, it appears they have now undertaken to accomplish the same results by means of a governor in connection with the intake valves, thus practically reversing their ideas. While detailed information is not at hand, the following outline and illustrations will give an idea as to the method adopted, although the meaning of those portions of the descriptions which deal with the electrical control of the valves is by no means clear.

Figure 2 gives a front view of the 4-cylinder 16-horsepower motor, Fig. 1 a transverse section through the axis of one of the cylinders, and Fig. 3 a partial plan. The regulating of the motor is effected through the admission of the gaseous mixture, either by means of a cock with a single valve or through the control of the admission valves. The two admission valves of one group of two cylinders are arranged in boxes, a, upon which presses a crosspiece, b, through its extremities. This piece is secured to the explosion chamber, c, by a nut, d, and a bolt, e, so that the dismounting may be effected solely through the unscrewing of the nut. The arrangement of each suction valve is such that the part can be replaced by another, including an electro-magnet, into which a current is sent by the regulator. The magnetic suction valve dispenses with any other regulation of the admission of the gaseous mixture. The substitution of this new valve for the ordinary one can be effected without any modification of the explosion chamber. The plugs, x, of the exhaust valve boxes are held in a similar manner by crosspieces and nuts, z. The control of the exhaust valves is obtained through a cam-shaft, f, entirely enclosed in the casing, and acting upon simple rods, g, which lift the valves at every rev-



Figs. 2 and 3—Elevation and Plan of Centaur Motor.

olution of the shaft. Each of these rods is guided by a double fork, h, embracing the cam-shaft, f. The cam-shaft is completely enclosed in a casing, i, open only to the crank chamber of the motor. It is lubricated by the oil continually thrown by the connecting rod-heads,

b. Provision is made so that the cam-shaft can be readily adjusted or dismantled. Figure 1 represents a motor in which the ignition is effected through an incandescent tube; but it is pointed out that this motor has been specially studied from the point of view of electrical ignition. The cylinders are connected in pairs and provided with a water-jacket, m, at the upper part. The

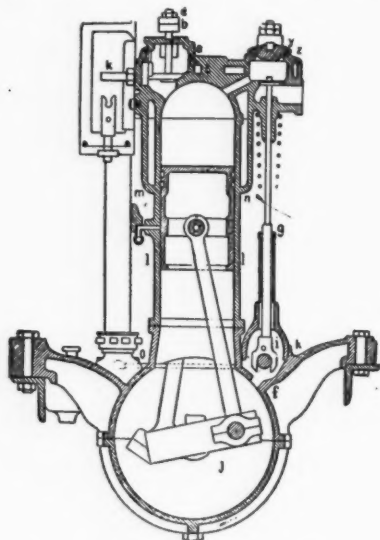


Fig. 1—Section of Centaur Motor.

pistons are of cast-iron with cast-iron segments. The centrifugal governor, n, mounted upon the cam-shaft, acts directly upon the admission valve. It is capable also of electrically controlling the admission valves. In this case it displaces a simple key, which comes into contact with one, two, three, or four flexible strips of metal.

Wire, Wood and Patent Wheels

If any man says that wood wheels are entirely out of the question for use on automobiles he will be sure to meet sharp contradiction. The regular coach wheels seen quite frequently on automobiles seem to be adapted for use on vehicles of that class, no matter by what power they are driven. Some say there is no suitable means for rigidly fastening the sprocket to the spokes so as to guarantee their continuous running. But the sprockets can be, and have been, clipped to the spokes as strongly and tightly as is needful, and we can see no reason why they should not run true if first-class axles are employed, says the Carriage Monthly.

With wire wheels it is, of course, practically impossible to clip the sprockets to the spokes, but there are flanges on the hub through which they can easily be bolted. This construction has been uniformly satisfactory, as it insures true running.

For the general run of automobiles, however, patent wheels are preferred. In fact, these are the strongest wheels, but they do not always look well. In fact, no one kind of wheel seems to suit for all kinds of automobiles. For the very lightest, such as first-class elec-

trically-driven vehicles, plain low wheels look well and their appearance is unobjectionable. They are probably the lightest wheels that could be used for this class of work. On all vehicles built for carrying freight the patent wheel has thus far proven the most satisfactory, adapting itself, as it does, to the necessary changes in construction and possessing the greatest strength.

Patent wheels, in form and construction, are essentially an American invention. It is needless to say that there is a wide variety of them. Each patent has its own peculiar merit. One of the most popular is the Warner. This has a sleeve which covers the wood part into the iron sockets of which, while the spokes are fitted, the first mortises enter the wood. For general service the Sarven wheels are considered the best by many automobile makers. This wheel has two sleeves, or flanges, which are bolted or riveted together with the spokes between them. The spokes form a perfect periphery; that is, the entire iron flange is filled by the fourteen or sixteen spokes in each wheel. This makes the hub solid and compact, and results in a wheel as strong as any yet built. A disadvantage of the Warner wheel lies in the fact that if the spokes shrink in the socket there is no way of tightening them, while in case of the Sarven the spokes can be tightened edgewise and can also be forced down toward the box, if the boxes are removed.

In cases where the axle is stationary and the wheels revolve on the axle arm, the sprocket wheel can be secured either to the hub or the spokes. When fastened to the hubs it is invariably bolted, but when secured to the spokes, it may be either bolted or clipped. When bolted, the spokes are dressed so as to leave a flat space on each or every other one—the spokes being dressed to suit the diameter of the sprocket—and when clipped, the sprocket rests flatly on the regular finished spokes, each of which is clipped to it. Bolting the sprocket to a flange requires a stronger wheel, while, on the other hand, clipping has the advantage that the power is applied near the felloes and tires, and is not transmitted from the hub. In this case there is less liability of the spokes getting loose.

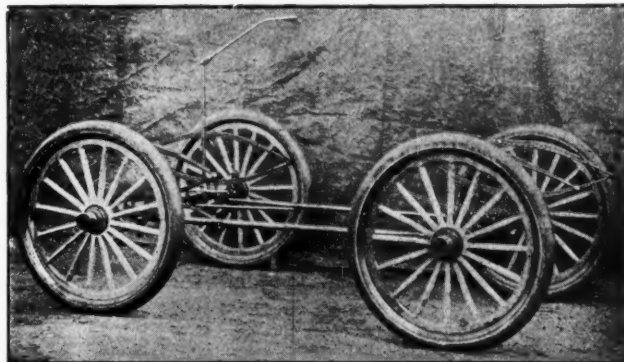
Just Complaint from a Foreign House

Foreign houses are continually complaining, and with good reason, of the carelessness of American correspondents in the matter of postage. It is a too common occurrence for the foreigners to have to pay double the amount of postage which the sender of a package or letter has neglected to supply. This paper has often, at the request of its foreign subscribers, called attention to the matter and suggested that an envelope of distinctive color be used for foreign correspondence. The latest complaint comes from one of the best houses in Australia, Armstrong Bros., of Perth, who enclose an envelope from an American house and say that hereafter they will return such letters unopened.

On Friday evening of last week the Ohio Automobile Co. celebrated the completion of its new building by giving a dance for its employees and their families.

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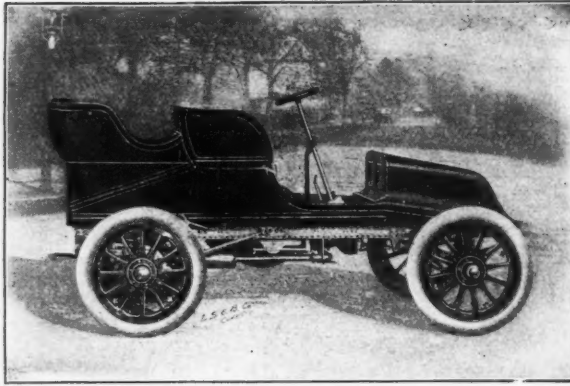
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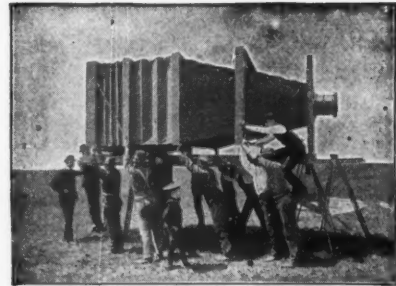


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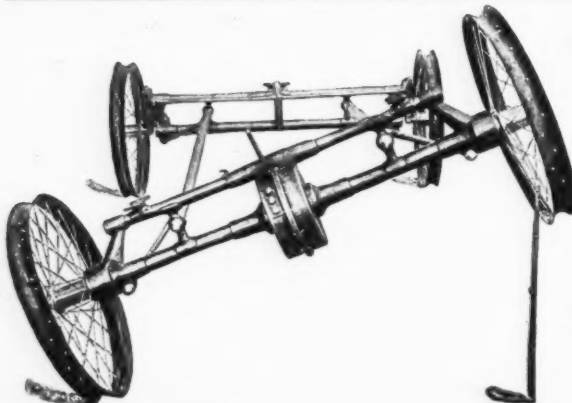
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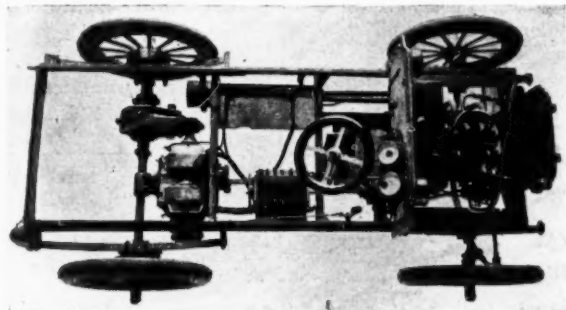
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A Couple of Interesting Features of the Late Paris Exposition

There were so many novelties at the Paris show that it would puzzle a Philadelphia lawyer to tell about all of them. One of those which attracted attention was the Champrobert carriage, which may be described as propelled by a combination of electricity and gasoline.



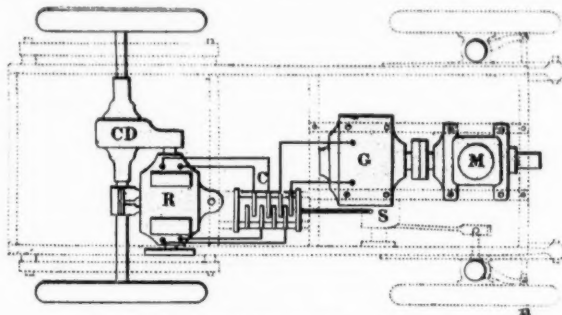
VIEW OF THE CHAMPROBERT FRAME.

In a few words, the accumulator is replaced by a motor on whose shaft is a dynamo. The machine weighs 1,200 pounds and runs at about 28 miles an hour. Its construction appears to be simple.

An 8-horsepower De Dion motor M bears, at the extremity of its shaft, a generating dynamo CT, a governor preventing its running more than the desired number of revolutions per minute, thus maintaining a constant current. The driving axle is governed by a motor R, wired to the dynamo and utilizes the current produced by the dynamo for operating the driving wheels.

Thus the dynamo and motor are only transmitting devices; the first one consumes 15 per cent of the power generated by the motor, in transforming it into electrical energy, and the motor consumes as much more in its transmission to the driving wheels, when changing it into operation; in short, only 30 per cent of the power generated by the gasoline motor is consumed in transmitting the power to the wheels.

As the consumption of power due to the gear transmission used in kerosene vehicles is nearly 50 per cent,



PLAN OF CHAMPROBERT CARRIAGE.

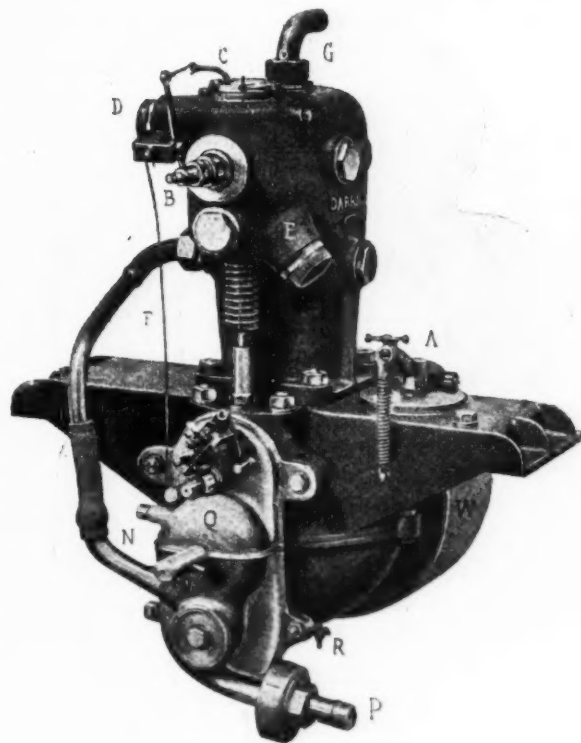
it is seen that the dynamic method of transmission used in the Champrobert carriage is more advantageous than that of the carriages with mechanical

transmission. Such is the opinion recently expressed in a French journal devoted to automobile interests.

This new Darraq, like the previous models of the same makers, shows an advanced knowledge of the requirements of an automobile. The motor with its pump, forming, as in the last year, one piece, easily detachable from the frame, is larger and more powerful than before. It now has 9½ horsepower and is balanced by an outer flywheel.

The lubricating and examining orifice, closed by the valve A, is an innovation. When the coiled spring which seats the valve is drawn, it uncovers a hole large enough to admit the hand and shows the head of the coupling rod of the piston.

The pump is composed of metallic blades which revolve in a casing in which the shaft is set eccentric. The blades are in two pieces each; between each two there is



THE DARRACQ MOTOR.

a spring which, aided by centrifugal force, compels the blades of the revolving part to closely fit the sides of the casing. Regulation is governed by the admission valve operated by the driver by means of a perforated plate, instead of the previous wing-lever.

The distance between the transmission shaft and the driving axle is maintained constant at all times by a strong horizontal tube or reach which is movably jointed at its ends and can revolve slightly in order to follow the movements of the frame. This is called the "balancier" or what we term the distance rod.

The shaft carrying the bevel gear which transmits the

power to the differential, instead of being cut off at the face of the pinion, is lengthened a few inches and provided with a bearing, thus eliminating any danger of binding of the gears.

The springs of the carriage are no longer rigidly fixed on the axles, but can freely slide through collars provided for the purpose.

The Connecticut Fiber Tire

To perfect a tire that would have all the advantages of a solid and of a pneumatic, but with none of the disadvantages of either, has long been the dream of the inventor. A short time ago a tire was placed on the market by the Connecticut Fiber and Tire Co., Bridgeport, Conn., that is an object of interest to the trade. The company has secured the exclusive right to manufacture and sell a secret process for preparing cotton by chemical process, and this process is a feature of the tire. It is an armored tire with double compartments, one of which is for the air space and one for the armor. The latter is between the air tube and the tread of the tire, making it practically non-puncturable. The armor takes all the strain off the air tubes, protecting



THE FIBER TIRE.

the face or tread of the tire, and makes it impossible for the fabric to chafe or separate. Air tubes in tires become weakened by the strain of riding, and often give out entirely either in the shape of the so-called stone bruise or in a separation of the fabric from the air tube. In the Connecticut fiber tire, however, the air tube is fully protected by the armor, which is not stiff or hard.

The Connecticut tire is said to be resilient, unlike most other non-puncturable tires. The makers cite one instance of an automobile weighing more than 3,000 pounds that has been in almost constant use since August without a cent's worth of expense for tire repairs.

A movement is on foot in the New York Athletic Club to organize an automobile division to take the place of the bicycle division and convert the cycle room into a motor vehicle storage station for the members.

VIEWS OF CORRESPONDENTS

LINCOLN, NEB., Dec. 30.—Editor MOTOR AGE:—I lately had occasion to answer a number of inquiries relative to the construction of a light gasoline vehicle, the power necessary, and so forth. I am inclined to think this is a matter which will interest many and therefore take the liberty of offering my views.

The question of weight and power is one that must be given consideration from many points, such as road conditions, weight of the machine complete, number of passengers and method of transmission of power. All these points will be found to cut an important figure, especially in a machine built as lightly as possible and with no more outlay than is necessary.

A light, efficient runabout, with gasoline motive power, cannot be built under 500 pounds, or with less than 4 brake horsepower. That is, it would not be a desirable thing to attempt if a staunch rig is desired. The machine must be strongly constructed because of the strains which must be absorbed by the wheels, steering knuckles, axles, springs and frame work while passing over rough roads at speed. While lightness is desirable, in a way, it is not of such importance as some people think. It should be figured out in accordance with the ideas advanced above in conjunction with the speed at which the vehicle is to be driven, for on the latter feature depends the power that should be used.

It is the opinion of the writer that 4 horsepower is as low as it is wise to go. The machine will be expected to carry one or more persons, over good, bad and indifferent roads in all kinds of weather, at speed that is in excess of that allowed by law, and stand up to its work even though not given careful handling.

A machine can, however, be put up at reasonable expense. It is safer to figure on 1 or 2 horsepower more than is needed than to figure ever so little short. In transmission much power is lost and the gearing for that particular part cannot be provided with any too much care. Always keep in mind the fact that the reduction of friction means higher effective power derived from the motor and construct accordingly. Light machines can be made satisfactorily with ball bearings in the wheels and all running gear parts, but in the heavy types the roller or plain bearing is preferable.

Going back to the subject of motors it might be well to say that the air cooled motor, for light runabouts, is not the most desirable form, the water cooled giving much better satisfaction, especially in the size necessary to propel a runabout of 500 pounds. It is advisable to secure a motor of the balanced type in order to secure as little vibration as possible, and at the same time more continuous power, that type giving a power stroke every revolution of the crank-shaft. This will be found of advantage when driving over bad roads and up steep hills.

It has come to my notice many times that many experimenters are building vehicles, especially light ones, with no reverse. This plan is not desirable, for it makes the machine serviceable in one direction only and may be the cause of serious accident, particularly in large

Excursion Rates To The Chicago Show

To be held under the auspices of the Chicago Automobile Club and National Association of Automobile Manufacturers.

===== **MARCH 1 TO 8** =====

The Central Passenger Association has granted an excursion rate of one fare and a third for round trip.

Concessions are expected from other roads.

For details of plan of securing the reduced rate, send for Weekly Show Bulletin or watch the Automobile Journals.

Vacant Space

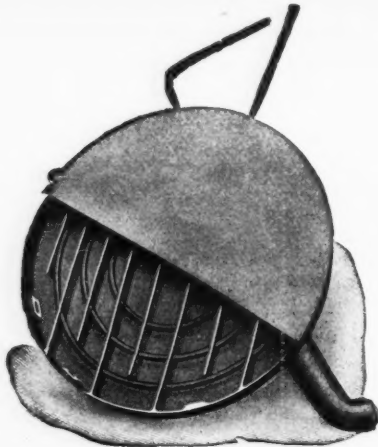
There is still a small amount of desirable space unoccupied. Applications should be made promptly.

The list of exhibitors to date:

Chicago Motor Vehicle Co.	Ohio Automobile Co.	Beardsley & Hubbs Mfg. Co.	K. E. Peterson.
Millwaukee Automobile Co.	Badger Brass Co.	Bachelle Automobile Co.	Hartford Rubber Works Co.
Warwick Automobile & Cycle Co.	Baker Motor Vehicle Co.	Brandenburg Bros.	Diamond Rubber Co.
Overman Automobile Co.	Knox Automobile Co.	National Vehicle Co.	Coe, Smith & Co.
White Sewing Machine Co.	20th Century Mfg. Co.	B. F. Goodrich Co.	Joseph Dixon Crucible Co.
Searchmont Motor Co.	Locomobile Co. of America.	Olds Motor Works.	Brown-Lipe Gear Co.
Elmore Mfg. Co.	Veeder Mfg. Co.	National Carbon Co.	Baldwin Cycle Chain Co.
Friedman Automobile Co.	American Bicycle Co.	U. S. Long Distance Automobile Co.	Midgley Wheel Co.
Geneva Automobile Co.	De Dion-Bouton Motorette Company.	Goodyear Tire & Rubber Co.	Porter Battery Co.
Ralph Temple Co.	Foster Automobile Co.	Electric Vehicle Co.	Spaulding Auto & Motor Co.
Haynes-Apperson Co.	Steamobile Co. of America.	G & J Tire Co.	Apperson Bros. Auto Co.
Winton Motor Carriage Co.	Frank J. Glover.	Geo. N. Pierce Co.	Buffalo Electric Vehicle Co.
Merkel Mfg. Co.	T. B. Jeffery & Co.	P. J. Dasey Co.	American Ball Bearing Co.
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receives and deadens the noise of the exhaust steam. It is situated in combination with the boiler, about four inches above it. In this way the waste gases from the burner pass under the muffler, mix with the exhaust and out with it, thus helping to render the exhaust steam invisible.

The Toledo Muffler also combines the function of a feed water heater by the placing in same of a feed water coil which runs spirally inside of it. These tubes come in contact with the exhaust steam, thus heating the water to a temperature of 208° before it enters the boiler. The muffler shown above is illustrated in section.

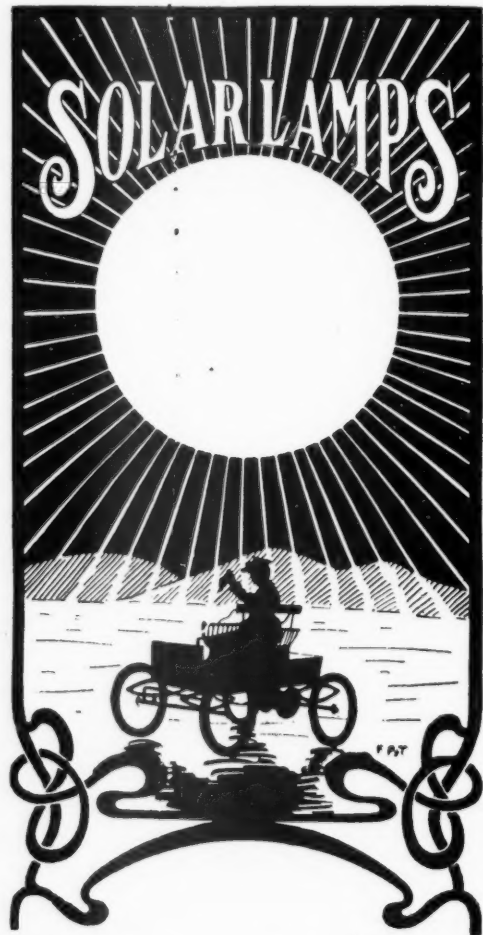
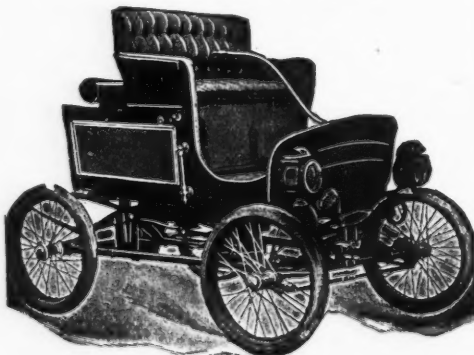
PRICES

Model A	- - - -	\$ 900.00
Model B (Model A with Top)	- - - -	1,000.00
Model C (Surrey)	- - - -	1,600.00
Toledo, Jr.	- - - -	800.00

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on account of their patented system of gas generation fill all these requirements. Knowing the truth of this statement, can you afford to sell your customers experiments?

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cities where the machine will of necessity have to be driven through traffic. A reverse is just as important in a vehicle of this class as it is in the horse drawn vehicle. In country localities, however, where travel is light, the reverse may be dispensed with, but even then it is not advisable. It is worth the extra outlay to put one on and the machine will have a great deal higher cash value with such an attachment than without it.—Yours, etc., N. O. ITALL.

The Position of Motors on Cycles

Chicago, Jan. 6.—EDITOR MOTOR AGE: The location of motors on cycles has been discussed ever since the motor cycle began to attract more than ordinary attention, and is still being discussed by riders and makers of motor cycles. The strange part of the matter is that the favor extended to machines of this class abroad tends more to the Werner type than to the standard pattern adopted in this country. The Werner has the motor mounted in front of the head of the machine, it being carried on the forks and attached to the handlebar stem, the latter forming an integral part of the equipment. The belt drive being used in connection with the front wheel, it is easily attached so that the rider is not inconvenienced by having the mechanism between his legs to cause a wide tread and make it necessary to reach down in front to open or close some valve or change the ignition, as is the case with the majority of motors mounted in the frame.

While the Werner type has many advantages in this line, it is doubtful if it will ever gain the popularity in this country that it has in England because of the motor being set so high. While many have argued this to be an advantage from the traction and balancing point of view, the fact remains that practice, in all forms of construction of self propelled vehicles, whether locomotives, ships, cycles or automobiles that are to travel at the highest possible rate of speed, and in which the greatest element of safety is desirable, places weight as low as is possible in order to produce the stability necessary to secure that result, and it is reasonable to assume that the same ideas will prevail in the construction of motor cycles.

It is interesting, however, from the standpoint that discussion of mooted questions is of benefit to the trade in general, to note the statement made in a foreign journal by one of the earliest devotees of motor cycling, that "his motor is mounted in the present Werner position and drives the front wheel by means of a flat leather belt $\frac{3}{4}$ in. wide." He continues: "This position, I hold, is absolutely the best for the motor to be placed in, as not only is the maximum cooling effect obtained, but any width of belt can be employed without fouling the rider's legs, and also all levers can be arranged on the motor itself, leaving the handlebar absolutely free, which adds much to the appearance of the machine. By the way, I should advise anyone investing in a motor cycle to specify a flat belt drive, as the round band, joined with a bit of wire must be more or less a toy."

There are many good points embodied in these few lines, especially those regarding the freedom of the rider's leg movement, and the flat belt, which undoubtedly is superior to the round or half V section used on many machines made in this country. These details will eventually be worked out to the satisfaction of a majority of users of such machines, and we may well rest content with the progress being made, for the solution of the problem as to what type or form is most desirable is a difficult one and cannot be reached without an extensive demonstration, a condition which is practically in operation throughout the trade at this time.—Yours, etc., D. J. Percy.

New Year's Century in an Automobile

There was a time when it was considered quite the proper thing among enthusiastic cyclists, to start out on the stroke of twelve on the last day of the year, in the endeavor to be the first to accomplish a New Year's century. The practice still prevails, though, of course, not to as great an extent, but the desire seems to have infected at least one person to emulate the example in an automobile. Incidentally the attempt furnished still another proof of the excellent characteristics of the little Pierce runabout made at Buffalo. Percy P. Pierce is the man who operated it, making the run from Erie, Pa., to Buffalo in 11 hours. Eighty-four miles of the distance was made in 6 hours, and no attempt was made at high speed. The last 16 miles was covered in an hour. The roads were not bad, but as the temperature stood at about 5 above zero, and there was considerable snow, the experience was somewhat trying for the operator. So far as is known at present, this is the first century completed in the New Year.

The Export of Automobiles

Washington, D. C., Dec. 27.—The exports of automobiles and kindred lines from New York for the week just ended were as follows: Argentine Republic, motor vehicles, five cases, \$132; British East Indies, motor vehicles, four packages, \$318; Japan, automobiles, three packages, \$883; Liverpool, automobiles, three packages, \$92; London, motor vehicles and parts, fourteen packages, \$8,334.

W. B. Williams and W. B. Cannon have formed the Automatic Machine Co., at Kalamazoo, Mich., whose business it will be to manufacture gasoline engines, friction clutches, automobiles, launches and launch fixtures.

Manager Densmore, of the Foster company, of Rochester, stated last week that the company is now turning out five complete machines a week and employing 50 men.

Editor and Proprietor Schwarzkopf, of Automobile Topics, has organized a stock company to carry on his paper. The capital is \$60,000.

The Auto-Body Co., of Lansing, Mich., claims to be employing 60 men and running the plant to its full capacity.

THE SPORT AND TRADE OF CYCLING

GEORGE G. GREENBURG, western member of the board of control of the National Cycling Association, has prepared a resume of the year's doings in the world of cycle racing in which he says that nothing but the good work of the manufacturers—by which, of course, he means the American Bicycle Co.—pulled racing out of a rut and re-established it on a sound basis. Early in the year, he says, the makers determined to take up the thread where it had been dropped some three or four years previously. The racing teams that they put in the field answered their purpose admirably. The result has been encouraging to all classes of wheelmen.

* * *

During the last three months that the racing teams were on the grand circuit more territory was covered than had ever been before in the history of cycling. The races brought out larger crowds in every town than had ever turned out to witness events of a similar nature. The races in the Stadium during the Pan-American Exposition at Buffalo brought together crowds of from 18,000 to 23,000 daily. And this despite the fact that the Stadium was built for other purposes than bicycling. In the matter of records and attendance the most successful game promoted at the Pan-American was cycling.

The advent of the motor cycle and the motor tandem marked an era in the history of the sport. The motor increased the speed and multiplied the excitement incident to a naturally exciting game.

* * *

The alliance of the Amateur Athletic Union and the National Cycling Association served to clear the sport to a very great degree from the taint of professionalism. Cycling had long been traveling with a blackened eye owing to the intrusion of the professional into the ranks of the amateur, and the alliance of the two bodies was welcomed by lovers of the sport throughout the country. The effect, however, has spread even wider than was intended and athletic sports in general have benefited by the determined stand which was taken in bicycling.

Mr. Greenburg expresses the opinion that in comparison with the men of today Bald, Cooper and Gardner were second raters. The assertion is safe, because beyond the possibility of being disproved, but is hardly fair to the old timers or pleasing to their friends, especially as the comparison was needless.

* * *

The six-day race at Boston ended Saturday night in a scene which must have brought blushes to the faces

of the writers who tell of the terrible condition of the riders.

The six leading teams were on even terms in distance traveled for the week. The great battle started on the last mile. Until the fifth lap the order was McFarland, Freeman, Gougoltz, Leander, McLean and King. Then Leander went ahead of the field. He was going very fast and McLean after him. While rounding the bank into the back-stretch Gougoltz and McLean came together and went down, the others running away from them. Leander still held the leading position until the opening of the last lap, when McFarland jumped and won first with Leander second, Freeman third, King fourth, Gougoltz fifth and McLean sixth. Chevalier and Fischer captured seventh prize and Krebs and Keegan eighth.

* * *

Trouble began almost an instant after the men were over the tape. McFarland, who won first place by inches only, jumped off his wheel and dashel at Leander. Other riders and trainers made a grab for the men and got Leander out of the way. Freeman next went after Leander and struck him full in the face. Thereupon riders, trainers and spectators took a hand. Policemen jumped in and straightened things out, but the excitement was intense. The fight had been brewing all day. It grew out of Leander's sprinting in the afternoon, which threatened to break up a supposed combination between McFarland, McLean and Freeman to take the race in that order. Leander's sprint broke up the combination, as he made it difficult for the three men to keep the places. Then, to add to the friction, Leander started the final sprint, and it was sooner than McFarland had figured on. It led to the spill and made the race anybody's. Referee Kelsey, who is the New England member of the board of control, said after the race that it was probable the National Cycling Association would investigate the affair, which he called most disgraceful. Afterward Freeman went to Mr. Kelsey to protest Leander.

Such are the Penalties of "Fame"

Although we hear a great deal less of them than formerly, century runs are still popular among a certain class of enthusiasts. The Century Road Club continues to award suitable prizes for the largest mileage made by members during the year. The contest in 1901 was won by Spencer W. Stewart, with 22,038 miles; L. T. Singer, with 19,292 miles, being second. Both of these men are residents of Brooklyn. The same city and the same people carried off the prizes in the century

A List of Headings to be Used in the Motor Age

Automobile Directory

Makers Who Have Not Sent Details are Requested to Mark the Items They Manufacture
and Send to Motor Age, Monon Building, Chicago.

Automobiles, freight :	Coaster brakes :	Lamps, electric :	Spokes, steel :
Automobiles, light deliv-	Charging outfits, elec-	Lamps, water gauge :	Spokes, tubular :
ery :	tric :	Lubricants :	Stampings, sheet metal :
Automobiles, electric :	Case hardening mate-	Lace, carriage :	Seats :
Automobiles, steam :	rial :	Locks :	Speedometers :
Automobiles, gasoline :	Chains :	Leather substitutes :	Screws, nuts, etc. :
Ammeters and voltmeter-	Dashes :	Leather cloths :	Springs :
ers :	Drive gates, automatic :	Matting, rubber :	Springs, for motors :
Alarms, low water :	Engines, gasoline :	Mufflers :	Seats, attachable :
Asbestos cement :	Engines, steam :	Motors, cycle :	Spark plug porcelain :
Accumulators :	Engines, kerosene :	Motors, electric :	Steering knuckles :
Axles :	Frames :	Mirrors, for steam car-	Steps :
Burners, kerosene :	Fenders :	riages :	Tools :
Burners, gasoline :	Forgings, drop :	Machinery and tools :	Tool cases, leather :
Brakes :	Forgings, rolled :	Mud guards :	Tandems, motor :
Bodies :	Frames, motor bicycle :	Nipples :	Trimings :
Boilers :	Fringes :	Name plates :	Tires, pneumatic :
Batteries, storage :	Glasses, water :	Odometers :	Tires, mechanical :
Batteries, dry :	Glasses, gauge :	Oil, cylinder :	Tires, solid :
Bearings, ball :	Gears, steering :	Oil cans :	Tire covers :
Bearings, plain :	Gears, differential :	Oil, lubricating :	Tanks, air :
Bearings, roller :	Gears, running :	Oilers :	Tanks, gasoline :
Bearings, ball thrust :	Gears, transmission :	Oil cups :	Tanks, water :
Balls, steel :	Gears, bevel :	Oil hole covers :	Tricycles, motor :
Bicycles, motor :	Gear wheels :	Plug switches :	Tops :
Bells :	Grease :	Plugs, spark :	Tank fillers :
Backs :	Grips, for steering bars :	Pinions :	Tire repair tools :
Binding posts :	Goggles :	Pilot lights :	Try cocks :
Brazing compound :	Gauntlets :	Pipe joint compound :	Tubes and shells, seam-
Bolts and screws :	Generators, gasoline :	Panels :	less :
Coils, spark :	Grease cups :	Pet cocks :	Tubing, steel :
Cement :	Gradometers :	Pumps, water feed, power :	Tubes, boiler :
Carbureters, other than	Gearing, spiral :	Pumps, water, auxiliary :	Top levers and springs :
surface :	Gauge cocks :	Pumps, air :	Torch heaters :
Carbureters, surface :	Gauges, gasoline :	Pumps, air and water,	Threads, silk and trim-
Crank cases :	Gauges, steam :	power :	mings :
Cranks :	Graphite :	Pumps, water, hand :	Valves, miscellaneous :
Charging outfits :	Heaters, feed water :	Pumps, oil :	Varnish :
Controllers, electric :	Horns :	Packing, rubber :	Valve stem eyelets :
Condensers :	Hydrometers :	Plugs, fusible :	Valves, tire :
Converters :	Hubs :	Quadracycles, motor :	Valves, throttle :
Chemical heaters :	Handling, steering :	Rims, wood :	Valves, safety :
Castings, aluminum :	Igniters, dynamo :	Rims, steel :	Wrenches :
Castings, bronze :	Injectors :	Rivets, tubular :	Whipcords, twine, etc. :
Castings, iron :	Indicators, for gasoline	Robes :	Washers and bushings,
Castings, brass :	tanks :	Regulators, water level :	mica :
Castings, steel :	Jacks, lifting :	Regulators, gasoline :	Wheels, motor :
Clothing :	Joints, flexible :	Spring belt tighteners :	Wheels, tubular :
Cushions :	Lamps, oil :	Sprockets :	Wheels, wood :
Cylinder oilers :	Lamps, acetylene :	Spokes, wood :	Wheels, wire :
Color and enamel :	Lamps, gasoline :		

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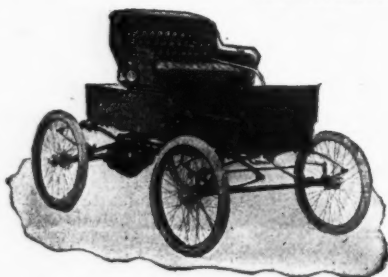
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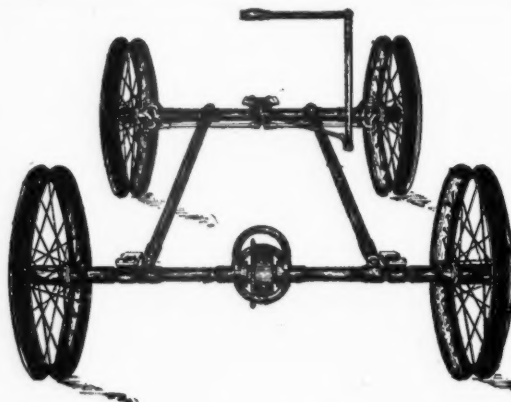


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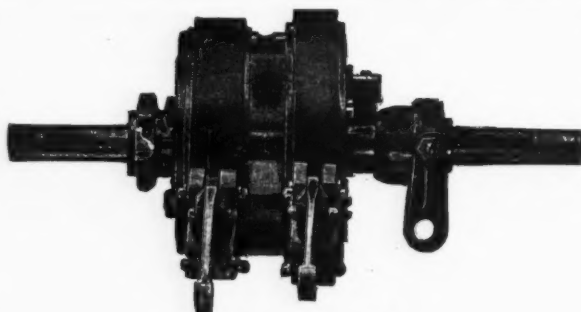
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17 State Street

NEW YORK

competition, except that their positions were reversed. Singer made 115 centuries during the year, and Stewart 101. The folly of this sort of thing is shown by a letter written by Singer, which indicates that he is either a first-class prevaricator or a fit subject for a lunatic asylum. This is what he says on the subject:

"I started to ride a wheel in 1899, and joined the Century Road Club in the spring of 1900. I started riding centuries in August of that year, and made 33 during the balance of the season. I continued riding after New Year's with the intention of making 100 centuries, but by the end of January I thought I would ride for the national championship, which Brown and Egloff of New York had won in 1899.

"Of the centuries ridden this year, 21 are doubles, 9 triplets, 2 quads, two quints and 1 sextuple. I weighed 125 pounds January 1, but only 100 pounds now.

"The two greatest hardships that I endured were saddle soreness and loss of sleep. Very often I would bleed from this soreness, and the pain was at times so terrible that tears would run down my face. On July 3 I started on an 800-mile ride, but was compelled to abandon it at 300 miles because of saddle soreness together with a broken saddle and crank.

"I have ridden 42 nights without any sleep at all. From May 1 to September 15 I averaged only four hours' sleep out of the 24. I had no trouble in keeping awake all night at first, but the monotony caused by continued multiple century riding made it very hard to keep awake all night, with the result that I often fell off the wheel while asleep.

"Toward the end of the summer I acquired a sort of knack of sleeping on the wheel, so that one night I rode 9 miles asleep, only awakening for a few seconds every few hundred yards so as to be sure I was not riding off the road. I only rode one night alone, being always accompanied by from one to ten members of the Century Road Club.

"I averaged 10 hours for each century. I worked 6 days each week, 9 hours a day. I had 2 weeks' vacation, which I took 2 days at a time. During the latter part of the season I have had to work evenings, which accounts for my falling off in mileage."

Midnight Races in New York

There were four New Year's runs in and about New York, all starting at midnight.

Shortly before twelve throngs of people began to gather at Bedford Rest, corner of Bedford avenue and Eastern Parkway, Brooklyn, to watch the preparations of the racers to Valley Stream and Coney Island.

While whistles were blowing and bells were ringing the riders for Valley Stream were sent away by John T. Wall. Muffled in sweaters and with their caps drawn tightly over their eyes, they sped along Eastern Parkway and its extension to Jamaica, and thence over the Merrick turnpike to Valley Stream.

Through Richmond Hill, through Jamaica and through Springfield the cyclists madly dashed with a clatter that provoked the barking of dogs and brought

suddenly awakened sleepers in fright to windows.

The other run, which started from Bedford Rest, was to Coney Island, under the management of the New York division of the Century Road Club of America. The route lay over the cycle path and return, the distance one way being more than 8 miles. The prizes were ten in number. The contestants were sent away a few minutes after the squad left for Valley Stream by P. A. Dyer, centurion of the New York State division.

In the Park Circle, at Fifty-ninth street and Eighth avenue, many people joined to give the riders to Yonkers and Tarrytown a cordial sendoff.

In the races to Yonkers and Tarrytown the course was up Central Park West and its extension to 155th street, across Central Bridge and out Sedgwick avenue, a distance of 15 miles. To Tarrytown the distance is 25 miles.

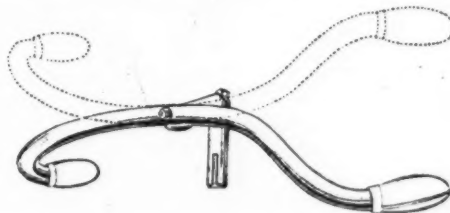
Started in 1888, these races were of an indiscriminate nature until 1896, when they were formerly taken charge of by the Associated Cycling Clubs. In the run to Yonkers the Gerbereux trophy is awarded to the club of which the winner is a member. The first man to Yonkers and the first to Tarrytown each receives a diamond medal, and also a bottle of champagne from the proprietors of the hotels where the finishers are scheduled to register.

W. B. Ferguson won the race at Coney Island. Ernest Gillott was beaten by two lengths, and George P. Perden was third. The race had thirty-two starters. A. A. Anderson, riding under the colors of the C. R. C. A., won the race from Bedford Rest at Bedford avenue and Eastern Parkway to Valley Stream, L. I., finishing his race in 30 seconds better than the previous record. Gus Egloff, the former record holder, was put out of the race by the high wind. Of the nineteen riders to finish, R. Schwartz was second, E. C. Hoffer third, and C. Barclay fourth. The riders had a supper and dance after the finish.

A. L. Kahn won the run to Tarrytown and the Sims Cup for his club, the Prospect Wheelmen, though H. Y. Bedell was first at Yonkers.

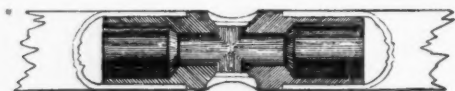
The California Handle Bar

The California bar is of the extension type, adjustable up or down without necessitating its removal from the stem or the removal of one grip as is required with



some makes. The center of the bar is made of steel 2½ inches long, over which the tubing is brazed. The forward extension is a drop forging, milled to fit the bar closely for half its circumference, so that when the bolt

is fitted in the hole provided for it and screwed tightly into the extension, the bar is held rigidly. Bars are furnished in all popular shapes, the one illustrated being the regular 21-inch with 3-inch drop and 1½-inch extension. The tubing used is the best seamless and all



nickeling is done over a heavy plating of copper. The illustrations show the center of the bar with tubing fitted to same, the extension post and the bar in two positions. This new product of the west is made by the California Handle Bar Co., 307 Larkin street, San Francisco.

Exports of Cycles and Material

Washington, D. C., Jan. 3.—The figures showing the exports of bicycles for the week just ended from the port of New York are as follows: Antwerp, \$535; Amsterdam, \$775; British Australia, \$2,971; British port in Africa, \$1,012; Brussels, \$144; Bakoo, \$94; Brazil, \$40; British East Indies, \$1,580; British Guinea, \$51; British West Indies, \$906; Cuba, \$132; Chili, \$50; Dutch Guinea, \$100; French possessions in Africa, \$15; Hamburg, \$3,958; Havre, \$4,559; Liverpool, \$700; London, \$3,069; Marseilles, \$340; Peru, \$26; Rotterdam, \$956; St. Petersburg, \$35; Santo Domingo, \$20; Southampton, \$550; United States of Colombia, \$160.

The Board Will Take Action

New York, Jan. 6.—The board of control of the N. C. A. will meet to-morrow to investigate the riot and alleged conspiracy that marked the finish of the six-day race at Boston.

The Post and Lester Catalogue

The new catalogue just issued by the above-named company is not only a handsome piece of work from a typographical standpoint, but contains a deal of valuable information in connection with the line of automobile supplies handled by the company and which is described and illustrated in detail. The lines of specialties which have been brought together represent those holding first positions in the trade. Solar lamps in different styles and sizes, the Cyclops, Motorliere, Imperial, Twentieth Century, Duplex and Dietz automobile lamps compose the line illustrated; Liberty and Hartford bells, Hartford horns, Veeder odometers, caps, gloves, tires of ten different makes, valves and cements of all kinds, as well as pumps and vulcanizers, make up the accessory part of the catalogue. These are followed by the pages devoted to rims and spokes, after which the heavier lines, such as running gears, bodies, buggy tops, engines, boilers, shells, etc., are shown. The Dayton, Covert and one other gear are shown, as are Eastman metallic bodies in two styles. Folding tops come in for prominent display, four illustrations of different pat-

terns being shown on one page. Keim and Dayton steam engines are listed, as are Locke boilers with copper shells and flues, Tonkin boilers with steel shells and copper or steel flues, Dayton and Kelly generators and burners, and, in fact, everything necessary to construct steam and gasoline machines. The gasoline motors catalogued are the Brennan, Crest and Palmer, the latter being for marine use only. The book consists of 42 pages and cover and is well worth the consideration of any one interested in the construction of self-propelled vehicles. It is published by the Post & Lester Co., Hartford, Conn.

Send for a Columbia Catalogue

Cycle catalogues are not now, as a rule, as elaborate or artistic as they once were. The 1902 catalogue of Columbia bicycles, however, is an exception. The cover design in several colors represents a breezy cycling scene and the inside illustrations are made up of beautifully combined half-tone and line work. An innovation which will prove of great advantage to users of the catalogue is a chart of specifications and equipments which is printed in the center of the book. Ten new models of Columbia, Hartford and Vedette bicycles are pictured and described at length. The introductory chapter gives a brief history of the development of the bicycle and dwells upon its advantages as a swift, sure and always ready vehicle adapted to a great variety of useful purposes. Various important improvements embodied in the new models are noted and the catalogue as a whole is one which must prove exceedingly interesting to members of the cycling community. Copies may be obtained by addressing the western sales department of the American Cycle Mfg. Co., 497-501 Wells street, Chicago, Ill.

The California Motor Cycle

While the motor cycle trade has been booming in the east little attention has been given to the advancement made in the same line in the west and the product of the California Motor Co., of San Francisco, will come somewhat as a surprise to those interested in this line inasmuch as the machine produced has originality in construction that tends toward simplicity.

The company was formed some time ago for the purpose of manufacturing motors, motorcycles and motor vehicles, but attention, it seems, has been given to the popular type of machine that can be used all the year round in that section of the country and can be bought at a price not so far beyond the reach of many as is that asked for larger vehicles.

All parts are produced in the company's own plant, but interest centers in the motor more than in any other part, the bicycle being made along accepted lines, but sufficiently heavy to properly perform its work. The motor is of the 4-cycle type, and instead of having the flywheels incased in the crank chamber, has one large wheel on the right end of the shaft, close to the case. The wheel being large and heavy, greater power is secured. All gearing and the sparking mechanism is located on the right side of the engine, im-

mediately underneath the flywheel. The crank case is made practically in one piece, with a side plate, and retains the oil.

A large tank in the upper portion of the frame contains the coil, gasoline and carbureter. The regulating lever is attached to the top of the tank and when set parallel with the top tube of the frame, no gasoline can flow from the tank to the carbureter. When the lever is turned to the left, it allows oil to flow. The carbureter forms the forward part of the tank. In its top it has a mixing valve which is controlled by a lever on the right side of the tank, and when turned toward the rear of the machine allows no air to enter the mixer and closes all openings, thus preventing evaporation.

A lever on the left side of the tank controls the amount of mixture supplied the motor. When the lever is turned toward the back of the machine it closes the throttle valve so no gas can be drawn into the motor. It also opens a porthole on the lower side of the throttle valve and at the same time opens the intake valve of the engine. The air, having free access through the port and intake valve to the cylinder, relieves compression and does away with the necessity of a pet cock. When the lever is thrown forward it opens the intake valve and closes the porthole in the throttle. If thrown to a perpendicular position, it opens the throttle and allows gas to enter the cylinder.

There are many other points of interest in the machine as described by the makers. The principal owners of the stock of the company are Leavitt & Bill, well known cycle dealers, and L. H. Bill, formerly with the Thomas company.

Cycling Miscellany

Eight riders left Syracuse on the stroke of 12, Dec. 31, in an attempt to make a century. They were killed off by the cold, two of them, however, riding as far as Canastota. Although several attempts have been made to ride from Syracuse to Utica on the first day of the year no one has succeeded in doing it since 1895.

MISCELLANEOUS

Advertisements under this head 5 cents per word first insertion; 3 cents per word each insertion thereafter. Cash with order. Express orders, postoffice orders or stamps received.

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FOR SALE—Conrad running gear with tires and body; empire transmission gear, $3\frac{1}{2}$ horsepower; air cooled gasoline engine; Loomis carburetor; Loomis muffler; Avery carburetor; lathe and shaper, used only in experimenting; also other parts and fittings. Address 1515 Garretson Ave., Sioux City, Iowa.

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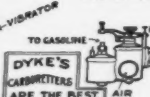
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